

AMERICAN MAGAZINE



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What's Your Telephone Score?

EVERY DAY many pleasant voices go over the telephone. And it seems to us the number is growing. For most people realize the business and social value of "The Voice with a Smile."

Sometimes what may appear like a gruff or hasty manner is not meant that way at all, but is simply carelessness or thoughtlessness.

Since this is the age of quizzes, how about a short one on some points of telephone usage?



Do You Talk Directly Into the Telephone?

The proper way to use the telephone for best results is to hold the transmitter directly in front of the lips while you are talking.



Do You Speak Pleasantly?

Remember . . . it may be your best friend or best customer. Greet him as pleasantly as if you were face to face. Pleasant people get the most fun out of life anyway.



Do You Hang Up Gently?

Slamming the receiver may seem discourteous to the person to whom you have been talking. You don't mean it, of course, but it may leave the wrong impression.



Do You Talk Naturally?

Your normal tone of voice is best. Whispered words are indistinct. Shouting distorts the voice and may make it gruff and unpleasant.



Do You Answer Promptly?

Most people do. Delay in answering may mean that you miss an important call. The person calling may decide that no one is there and hang up.

"The Voice with a Smile"

can be a real asset. Haven't you often said of some one who has just telephoned — "My, but she has a pleasant voice." Or — "I like to do business with them because they are so nice over the telephone."

It's contagious too. When some one speaks pleasantly to you, it's easy to answer in the same manner.

Many times you form your impression of people—and they judge you — by the sound of a voice over the telephone.



BELL TELEPHONE SYSTEM

THE BELL SYSTEM CORDIALLY INVITES YOU TO VISIT ITS EXHIBITS AT THE NEW YORK WORLD'S FAIR AND THE GOLDEN GATE INTERNATIONAL EXPOSITION, SAN FRANCISCO

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AMERICAN FORESTS

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THE AMERICAN FORESTRY ASSOCIATION

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The American Forestry Association is a citizens' organization for the advancement of intelligent management and use of the country's forests and related resources of soil, water, wildlife and outdoor recreation.

Its educational activities seek to bring about a better appreciation and handling of these resources, whether publicly or privately owned, that they may contribute in the highest degree to the welfare of the nation and its people.

In addition to publication of two magazines — AMERICAN FORESTS and CONSERVATION, both designed to keep before the people of the country important conservation questions and issues, the Association carries on educational projects in various fields including forest fire prevention, reforestation, protection of fish and wildlife, upstream flood control, prevention of soil erosion, preservation of wilderness areas, establishment of national forests and parks, development of forestry by private endeavor, the teaching of conservation in the schools of the country, promotion of research in timber growing and use and expansion of markets for forest products.

The Association is independent. It has no connection with any federal or state governments. It is non-political and non-commercial. All its resources and income are devoted to the advancement of conservation. It has been so operated since its founding in 1875. All citizens interested in forestry and conservation are eligible for membership.

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Member A. B. C.

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READERS' FORUM

PEACHES ON WALNUT TREES

SIR: You will be interested in the following extract from Vol. 2—"From Canada, Past, Present and Future," by W. H. Smith, 1850, Toronto: "A young Scotchman just arrived in the colony was staying on a visit with a family of our acquaintance residing on the bank of the Thames at London, Ontario. On the day after his arrival he walked out to take a stroll over the farm. Not far from the house he came to a halt under one of those magnificent black walnut trees for which the western district is so famous. It was late in the autumn and the ground beneath the tree was strewn with nuts. He stopped. What could they be? He had heard of American peaches and their great plenty and had read of their feeding pigs on them and he immediately concluded that this must be the fruit. What else could it be? He selected a fine one, raised it to his mouth, and took 'a good bite.' Such of our readers as ever tasted the pungency of the black walnut husk may imagine his vexation and disappointment. What could be the matter with it? It couldn't surely be ripe. He threw it down and tried another with no other result than setting his lips on fire; uttering a hearty malediction on the writers who had thus deceived him, he ran indoors, exclaiming that if those were American peaches he never wished to taste another."—H. H. Blanchet, 239 Laurier Avenue East, Ottawa, Canada.

ON THE SOUTHERN FIRE PROBLEM

SIR: John P. Shea's article, "Our Pappy Burned the Woods," in your April issue was one of the most interesting I have read in some time. But as I read through certain portions of it, I confess I wondered whether or not Dr. Shea possesses a full understanding of the woods burning problem in the southern states. He has very clearly presented the problem arising from the time-honored practices of certain native rural groups, usually characterized by woeful economic and educational underprivilege. But he failed entirely to point out that there is also an "outsider" problem of no small proportions.

For hundreds of miles up and down the Atlantic and Gulf Coasts pine woods are scattered hundreds of wooded estates

owned by northerners, and comprising millions of acres in the aggregate. The yearly burning of the majority of these forest holdings constitutes a large and growing forest fire menace, one that was not mentioned in Dr. Shea's appraisal.

It would indeed be interesting if the Forest Service would have Dr. Shea select a unit among these outsiders in the South to learn the why and wherefore of their woods burning habits. He would not, as in the case of his "hillbilly" subjects, find these outsiders ill-fed, ill-housed, and ill-clothed, for a great many of them are millionaires. He would, however, learn that some of their reasons for burning the woods are very similar to those motivating the "hillbillies" and "crackers."

Of course, any southerner would be rather short-sighted who did not appreciate the presence of these outside-owned estates. The taxes on the lands are paid, the activities of the owners provide employment, and they contribute in other ways to the well-being of the region. But they do burn their woods. And when they excuse their actions by saying that certain studies show woods burning improves quail and shooting, it might be pointed out that only a few of them are going to the trouble of careful, controlled, light burning, such as the particular studies recommend. Uncontrolled, wholesale burning appears to be the rule.—Charles R. Ross, Clemson College, South Carolina.

PRIZE GARDEN BOOK COMPETITION

SIR: The Macmillan Company announces a competition for the best garden book manuscript by an author who has not published a garden book previously. The award will be \$1,000—\$500 of which will be an outright payment, and \$500 an advance against royalties.

The competition will close November 30, 1940, and the award will be announced January 2, 1941. The final judges of the contest will be Carol Fleming, Channel Bookshop, New York City; Elizabeth Hall, librarian, New York Botanical Garden; and H. S. Latham, vice president and editor of the Macmillan Company.

Brochures giving the conditions of the contest, together with entry blanks, may be secured from Prize Garden Book Competition, The Macmillan Company, 60 Fifth Avenue, New York.—The Macmillan Company, New York.

NEW ENGLAND HURRICANE LUMBER FOR SALE

by

The Federal Surplus Commodities Corporation

(Northeastern Timber Salvage Administration)

Bids will be opened at 2 P. M. July 1, 1940, at the office of the Federal Surplus Commodities Corporation (Northeastern Timber Salvage Administration), Wendell-Phillips Building, 115 Chauncy Street, Boston, Massachusetts, for the purchase of 500 million board feet, more or less, of rough pine lumber, sawed or to be sawed by the said Corporation.

Location of Lumber

Approximately 245 million board feet of lumber already sawed is located at 340 storage sites in the six New England States. All sites are accessible by truck and some are adjacent to railroads. Detailed information concerning site locations, volumes, kinds, and dimensions of lumber will be furnished on request.

The remaining volume of approximately 255 million board feet will be sawed by the Corporation from logs now in water storage throughout the same area. An additional amount of logs and lumber, over and above the amount herein specified, has been reserved to provide for anticipated needs of local wood-using industries.

Description of Lumber

The lumber will be approximately 98 per cent northern white pine (*Pinus strobus*) and 2 per cent red pine (Norway).

Lumber sawed to date is in standard sizes (square edged). It has been sawed full dimension and will meet all reasonable requirements for resawing and dressing to standard sizes.

Sawing of the remaining logs will be adjusted to suit reasonable requirements of the purchaser.

All lumber has been well piled and that sawed during the staining season of 1939 was treated.

Bids

Bids for the entire amount will be given preference but bids for lots of 25 million board feet or more will be considered on the basis of the values of such lot or lots in relation to the over-all value of the entire amount.

Main Conditions of Sale of Entire Amount

1. Payment for all lumber must be made by January 1, 1945.

2. A minimum of 10 million board feet shall be paid for at the bid rate prior to January 1, 1941, and thereafter purchases shall be at the rate of not less than 10 million board feet per month, averaged on a quarterly basis.

3. The purchaser will be required to furnish a satisfactory performance bond in the amount of \$250,000.

4. A deposit of \$50,000 must accompany all bids, by certified check payable to the Federal Surplus Commodities Corporation. The deposit of the successful bidder will be retained and applied to the purchase price of the lumber; or, if the purchaser fails to meet requirements, may be retained as liquidated damages. The deposit of unsuccessful bidders will be returned.

5. Lumber will be sold in the condition in which it is found in piles at the storage sites. The sale will include merchantable pile bottoms and roof boards.

6. No bid of less than \$22.50 per thousand board feet of lumber will be considered. On January 1, 1941, and at three-month intervals thereafter, the Corporation will make adjustments in the bid purchase price, either up or down, on the basis of variations in an index figure of prices of competing pine lumber. Adjustments will also be made in the bid purchase price in the event the lumber inventory varies more than 10 per cent in any one grade or thickness from present estimates. At no time during the life of the contract, however, will the purchase price be below \$18.00 per thousand board feet.

7. The right to reject any and all bids is reserved.

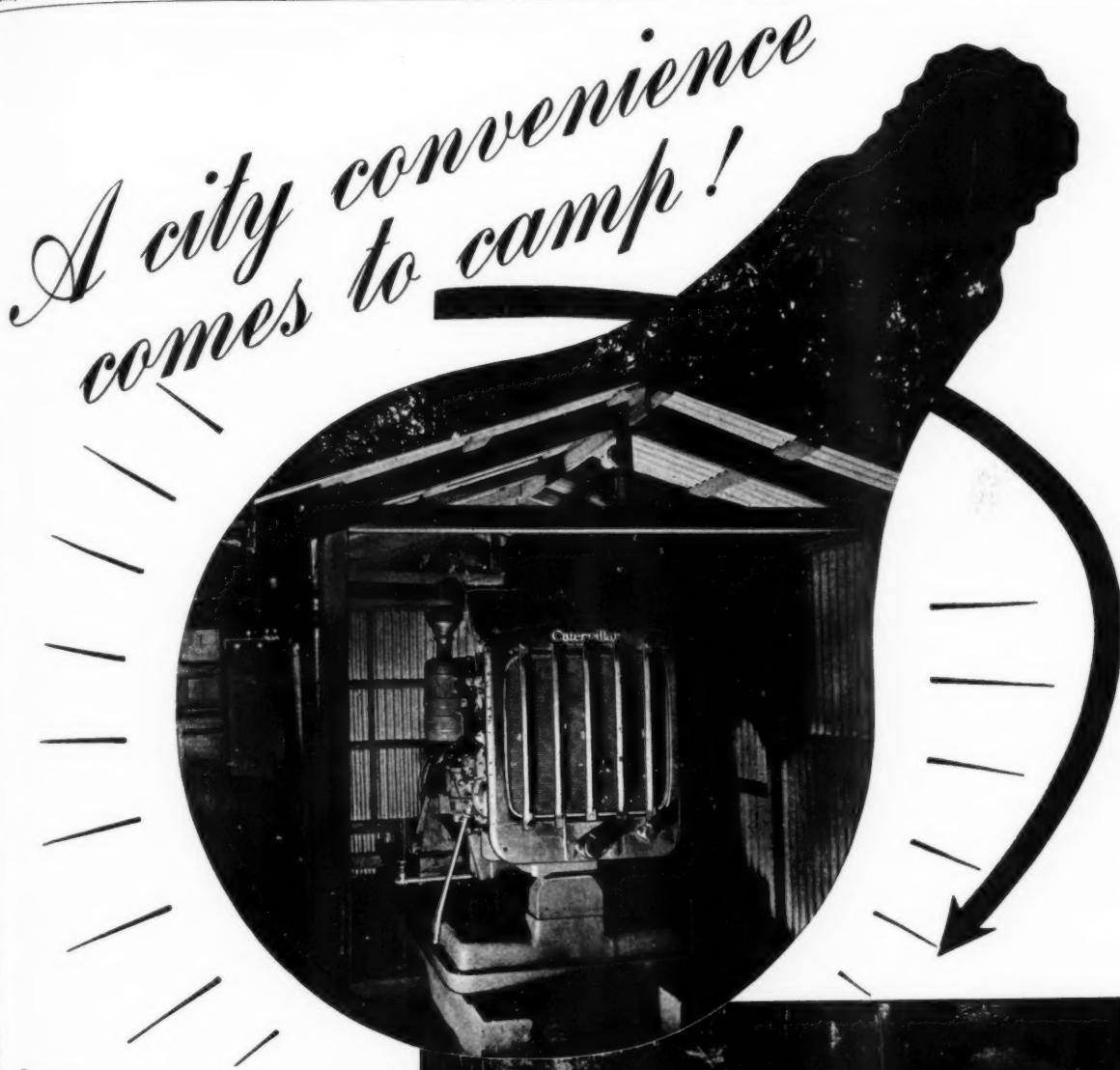
In sale of less than the entire amount the above conditions will be modified to the extent desirable to make them consistent with the volume, location, and character of lumber on which bids are made.

Responsibility of Bidder

Before a contract is awarded the bidder will be required to furnish the Corporation evidence of satisfactory financial responsibility.

Bid Forms and Detailed Information

Bid forms and further information can be secured from the Administrator of the Northeastern Timber Salvage Administration, 115 Chauncy Street, Boston, Massachusetts. Prospective purchasers can arrange to inspect the lumber on application to the Administrator.



IN THE growing, nation-wide movement to make America's natural recreational facilities of greater service to the public, "Caterpillar" Diesel power plays a vital part! And that is not only true of tractors and motor graders which build and maintain highways and trails as well as provide fire-protection in our wilderness areas . . . but it is also true of electric sets and engines!

At Big Sur Camp in Pfeiffer State Park, California, two "Caterpillar" Diesel Engines furnish a city convenience that would have been too costly—if not impossible—a few years ago. For these generator-connected "Caterpillar" Diesels supply Big Sur with electric light, heat and refrigeration—at a kw. hr. cost that averages approximately 1 2/10c.

Recognizing the utility, convenience, economy and dependability of "Caterpillar" Diesel power, federal, state and municipal governments employ it to a wide extent—to the taxpayers' profit!

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CATERPILLAR
REG. U. S. PAT. OFF.
DIESEL ENGINES AND ELECTRIC SETS
TRACK-TYPE TRACTORS • ROAD MACHINERY



SAMUEL T. DANA

SAMUEL T. DANA—one of America's first-line foresters, able educator and distinguished in his profession, was first elected to the Board in 1935, after serving as a vice president for two years. His active connection dates back much further than his official connection, however, for during his many years in the United States Forest Service, Mr. Dana was in close sympathy with and supported the national work of The American Forestry Association.

Born in Portland, Maine, in 1883, "Sam" Dana, as he is affectionately known to his army of friends, took his A.B. at Bowdoin—*summa cum laude*—in 1904; and his M.F. at Yale in 1907—again *summa cum laude*. He also holds the honorary degree of Sc.D. from Syracuse and Bowdoin.

Entering the United States Forest Service in 1907 in the

OUR DIRECTORS

office of silvies and forest investigations, he served until 1921 in various administrative capacities in the Branch of Research. Then for two and a half years he was Commissioner of Forestry for the State of Maine, later becoming the first Director of the Northeastern Forest Experiment Station. In 1927—after eighteen years with the Forest Service—he assumed his present position as Dean of the School of Forestry and Conservation at the University of Michigan.

With such a background of experience, his work at Michigan has been outstanding. His brilliant emphasis on social implications in the fields of forestry and general conservation is his greatest contribution to teaching. Active in the work of the Social Science Research Council, he has also served as President of the Society of American Foresters and Editor-in-Chief of the *Journal of Forestry*. He was Treasurer of the Society from 1910 to 1913 and a member of the Executive Council from 1913 to 1924. In 1925 he was elected president and served for a period of two years. In 1927 he was again made a member of the Executive Council due to a vacancy created by the election of one of the Council members to the Presidency. He was on the Editorial Board of The American Forestry Association from 1911 to 1915 and has been a member of the Ecological Society, American Association for the Advancement of Science, and other similar scientific organizations for a number of years. Forest Service representative to the World's Forestry Congress in Rome, he was also made a delegate of the Department of Agriculture to the International Institute of Agriculture.

Alumni of the "Trail Riders of the Wilderness," Mr. and Mrs. Dana acted as Association hosts on the Wind River trip in 1935. Mrs. Dana, who is herself a biologist and educator of parts, has been an effective partner in her husband's many varied activities. Outside of his profession, Sam Dana plays a fast game of tennis, is well informed and keenly interested in bird life, and is seen a good deal with his field glasses in and around Ann Arbor, where he now makes his home.

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John W. Watzek, Jr., 1940—Illinois—National Lumber Manufacturers Association

Vanderbilt Webb, 1942—New York—New York Forestry Association

William F. Whartoz, 1942—Massachusetts—National Association of Audubon Societies



The EDITOR'S LOG

deeper over American soil and challenge a reading of their probable meaning to our future course of life, liberty and pursuit of happiness.

That the war is pulling and straining us — spiritually and materially — in many directions is manifest. The extent to which it may affect our forest economy is still as problematical as the war itself, but abundant signs portend deep changes. War calls for great quantities of wood and of things made of wood. Neither France nor England are self-sufficient as to forests and countries from which they have been getting their wood supplies are progressively being blacked out as the war lines expand.

"The northern European countries which furnished us with the largest part of our wood supplies," recently wrote a French forester, "are closed to us, and God alone can tell for how long." He was, of course, referring to Scandinavia, Finland, and Russia. Large French houses, particularly those that export to the United States and Canada, he went on to say, "can't find in France either in the form of wood or cardboard the necessary packing crates for their consignments. Very large quantities are needed, in fact unlimited quantities." So it is in other countries in Europe — belligerent and neutral — which must have wood both for war and for maintenance of export trade. They are turning to the United States, and if and as the war continues the whole world — at least that portion that has access to the seas — may be forced to turn more and more to the forests of America.

In the forests of the Pacific Northwest, the war is writing a different story. On May 1, forty-three of some 120 ships which had been engaged in intercoastal trade between Oregon and Washington and Atlantic coast points had been lost to the Pacific Northwest. They have been drawn into foreign trade by exorbitant cargo rates offered by the war-pressed and war-threatened countries. Those forty-three ships have been carrying to eastern markets thirty-seven per cent of the Oregon and Washington lumber production. Ships to take their places are not available and tidewater mills are being forced to curtail production or close down, throwing people out of work. The condition is not peculiar to lumber alone. It extends to other intercoastal shipments, notably wheat and wood pulp.

On the opposite side of the continent, another pattern has taken readable form. It has its genesis in late events in Scandinavia. The United States is the greatest importer of pulp and paper in the world. Last year eighteen per cent of its craft, thirty-eight per cent of its sulphite, and seventy-four per cent of its newsprint came from other countries. Most of its craft and sulphite imports came from Sweden, Finland, and Norway; most of its newsprint imports came from Canada. The Scandinavian countries are now blocked off, and apparently will remain so for an uncertain period. This means that in order to meet our own needs, we may shortly have to draw more heavily upon our own forests and the forests of Canada. What war-impelled measures Canada eventually will be forced to take in respect to unlimited cutting of its own forests is one of many uncertainties.

These and other signs are in the war shadows that criss-cross our forest lands. Piecing them together, there emerges the tenable prediction that if the war long continues our forests will be subjected to heavy drain, the price of lumber, wood pulp, and paper will be forced upward, and growing timber in this country will take on new values. It is a situation that bears careful watching and careful handling that our forest resources may not be sacrificed to a war-crazed world economy but may be wisely conserved for our own defense—be it peace or war.

One Foster
Editor.



The Blue Ridge Parkway—route of beauty to the wilderness—is the longest new road planned as a unit in our highway history and will eventually link the Shenandoah National Park, the George Washington, Jefferson and two divisions of the Pisgah National Forests and the Great Smoky Mountains National Park. This beautiful lookout is at Bluff Park, North Carolina

The Blue Ridge Parkway

By STANLEY W. ABBOTT

WITH the steady advance toward completion of the Blue Ridge Parkway in Virginia and North Carolina, there emerges a first clear picture by which to appraise the worth of the parkway idea as a means of bringing the national parks and forests closer to the people.

Nation-wide recreational surveys that look beyond the local horizons emphasize not only the need of the featured parks and forests at the "end" of the tourist journey, but the betterment of the journey itself. The route to the wilderness often passes glaring billboards, hot dog shanties, and gas emporiums; a route traveled by trucks and buses, through a succession of towns and cities nervous with the business of living. These are the things which the traveler for the most part seeks to leave behind, and yet after their subtraction from both ends of the usual journey there is often little left which can be counted as a sum total of benefit.

The Parkway project in its most simple analysis is something of a first direct answer to the requirements of the vacation motorist—a new element in recreational planning. Since the 500-mile scenic motorway will provide a well rounded vacation, high above the summer temperatures, remote from the towns and cities, and yet within a day's drive for 60,000,000 persons, it should amply test the soundness of the idea. Amid much talk of a national system of specialized highways, this proving ground for the scenic parkway is timely. While any country-wide system would doubtless concern itself largely with express regional routes, many planners believe there is a place for the road of the purely recreational type.

The Blue Ridge Parkway is the longest new road planned as a single unit in American highway history and, chain-like, will link the Shenandoah National Park, the George Washington and the Jefferson National Forests, two divisions of the Pisgah National Forest, and the Great Smoky Mountains National Park; and so it will fuse a large block of the eastern highlands into one recreational unit. From end to end of its now fully projected route, the Parkway will average better than 3,000 feet above sea level. Thus the summer tourist will travel the length of two southern states always in the invigorating coolness of the high mountains.

The completed portion of the Parkway, including a 140-mile continuous stretch between Roanoke, Virginia, and Blowing Rock, North Carolina, differs from the usual commercial highway principally because of the parkway idea. Constituting a first adaptation of the broad right-of-way to the rural region, it differs also from such parkways as Colonial and Mt. Vernon and those near New York City which fit so well into the suburban plan. Though resembling in scale the Skyline Drive in

Shenandoah National Park, it bears only remote likeness to this foster parent, despite the fact that it was from the enthusiastic reception of that road by the public that the Blue Ridge project had its birthright.

By legal definition a parkway is described as a road devoted to recreation and located in a broad right-of-way along which the abutting property owners have no right of light, air, or access, and so is distinguished from the ordinary highway devoted to movement of traffic and within a narrow right-of-way along which the land owner has these various rights. According to this principle the highway departments of Virginia and North Carolina as their share in the joint enterprise are acquiring for the federal government what is essentially a recreational area, 480 miles long and about 800 feet wide. Through this park-like ribbon of land is built the two-lane motorway. As a result of public ownership of land, the naturally beautiful roadside becomes possible of preservation, and where it has been despoiled, possible of landscape improvement. In effect, an ever-to-be-green, signless,

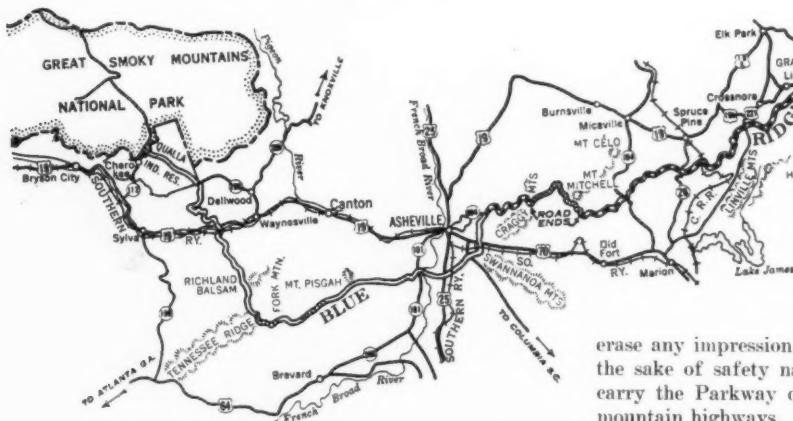


In Southern Virginia, the Parkway winds in beauty through farm fields in the Valley section



The policy of Parkway control assures that this will be an ever-green, signless, noncommercial road, set aside for motor recreation. This vista, seen from below, is of the Peaks of Otter, north of Roanoke, in Virginia

and noncommercial cross section of the eastern highlands has been set aside for motor recreation.



The acquisition of thousands of private tracts more or less in the immediate path of the power shovel has required the closest working together of the state and federal agencies. Studies by the National Park Service call for land acquisition which varies in width from 200 to 1,200 feet, and the requirements must be judged as much for the effect upon the residual private property as for control of the roadside picture. Private and public roads, cattle crossings, water rights, phone and power lines seriously involve the whole economy of many mountain farms. Relocations of these facilities must be arranged or entire holdings purchased outright. These problems and the natural desire of many mountain people to hold to the homes of forefathers contrive to make a more than usually difficult problem of acquisition.

The Blue Ridge Parkway is laid out expressly as a route for the leisurely tourist, but there has been little compromise in meeting the requirements of safety, rea-

sonable speed, and ease of driving. Viaducts, tunnels, retaining walls, and other special devices of the highway engineer have been employed in subduing the sharp curves and steep grades that normally characterize the mountain road. This strict discipline of the natural contours by Diesel power and dynamite has in some places resulted in a considerable scar even with unusual care in planning and construction. In certain rugged regions, excavation to create the thirty-foot road section has meant as high as 100,000 cubic yards to the mile (in low country four-lane highways are often built with as low, as an average, as 20,000 cubic yards to the mile).



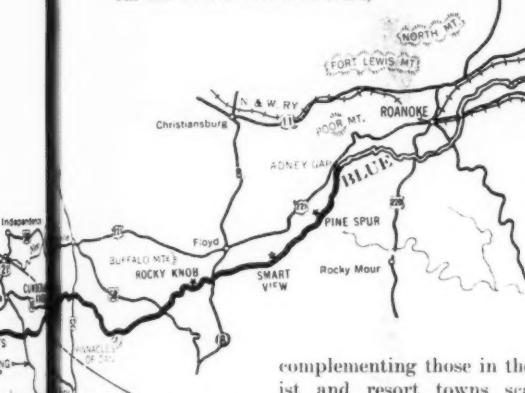
Technicians are nevertheless confident that landscaping, plus the kindness of time, will largely erase any impression of ruthless machine methods. For the sake of safety native stone and timber bridges will carry the Parkway over or under the important trans-mountain highways. And operating policy will limit use of the Parkway to passenger vehicles. Where location of the Parkway interferes with utility roads, these are relocated to the side so that the independence and continuity of the routes for trucks and buses are maintained.

In order to keep construction costs within reasonable bounds while still holding to standards of curvature and grade, and as much to avoid excessive scar, it has been necessary to skirt some of the more rugged mountains. As a result the Blue Ridge Parkway does not exclusively follow the skyline but assumes a changing position with respect to the ridge tops.

While the sweeping views over the low country may be compared to the full voice of the symphony orchestra and are the sounds that lift one from his seat, there are fine notes as well when the Parkway leaves the ridge for the more gentle slopes and the deeper forests. In fact, the panoramic crescendos seem even bolder for the contrast with these muted themes. Of yet quite different character, but still of interest to the overall pattern, are

the quiet fields and pastures which make unusual designs in many highland sections. Here an abandoned log cabin strikes a strange chord from out the rhododendron thickets, and again the air is haunted by a grist mill long stilled except for the water which splashes through a broken tail race—a sufficient chronicle of human history in these very old American mountains.

As much as possible these features of nature and of history on the Blue Ridge will be preserved. Federal funds have been used to acquire many of them in their setting, and well beyond the normal width of right-of-way. In places an area of 6,000 to 10,000 acres embraces a whole group of mountains. Selected also for logical distribution along the Parkway, roughly at twenty-mile intervals, these wayside parks will provide the setting for limited tourist facilities. Picnic and camp grounds, motor supply service stations, and sandwich shops will round out the motor vacation land,

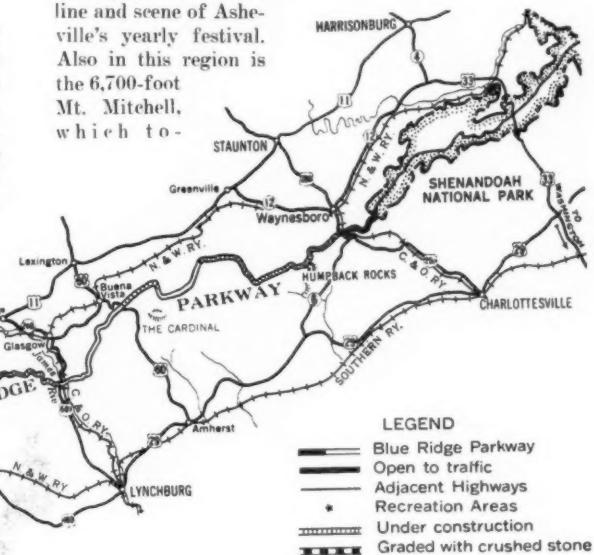


complementing those in the tourist and resort towns scattered

through the mountains. The recreational areas are being developed concurrently with Parkway construction through the CCC and the ERA work programs. Along with the provisions for many forms of active recreation, large areas in these parks will remain undeveloped so that the visitor may withdraw from the Parkway traffic to tramp or fish in the unbroken forests. Of interest to hikers is the Appalachian Trail which, on its way from Maine to Georgia, closely parallels the Parkway route through Virginia.

The roster is long of the geography famous in the southern Appalachians. The new Parkway claims close or distant relationship to far more than should be listed here. Notable in Virginia are the Humpback Rocks and the James River Gorge where the longest Parkway bridge will span the river, a two-track railroad and a major state highway leading to nearby Natural Bridge. The twin Peaks of Otter north of Roanoke have been famous as a resort since the days of the horse-drawn coach. The Pinnacles of Dan on the Floyd plateau are now the site of an unusual hydro-electric development and are still of interest to students of geology and scenery alike. These rock cones project to rim height above the Dan River Gorge. South of the state line through the bluegrass highlands the pattern is

one of fields and grazing cattle. In North Carolina are Grandfather Mountain which comes justly by its patriarchal name, the Linville River Gorge recently added to the Grandfather section of the National Forest, and the Craggy Gardens, balds of purple rhododendron above an unexplained timber line and scene of Asheville's yearly festival. Also in this region is the 6,700-foot Mt. Mitchell, which to



gether with its strapping sons among the Black Brothers composes the most skyward prominence east of the Mississippi. Skirting Asheville City, the Parkway will



Planned specifically as a route for leisurely travel, safety, reasonable speed and ease of driving are assured. Sharp curves and steep grades have been subdued. Here is seen a handplaced rock embankment, or retaining wall

settle to cross the French Broad River and then will rise high through the famous Vanderbilt forest in the Pisgah Mountains to approach the Great Smokies through back country in the Qualla Indian Reservation of the Eastern Cherokees.

Perhaps the finest inspiration to be found in these forest-clad eastern mountains comes with the spring and the lavish flowering of an exceptionally wide range of trees and shrubs. The season extends from mid-April well into July, breaking first with the shadblow, closely followed by the dogwood and redbud.

The pink azalea and the rare native flame azalea spread like fire through the under-brush and are unequalled in extent and color. After mid-June the mountain laurel and the purple and white rhododendron are at their best, which superlative is fully justified, for in the Blue Ridge these plants reach tree-like proportions. Forest trees are also of wide variety. White pine, hemlock, and the balsam are among the finest of the evergreens; while the maples, oaks, the beech and sour gum especially contribute to mountain color in the autumn. This range of plant material is reflected in the landscape development plans which call for the planting of only such native material as occurs in the adjoining woods. This program is less one of embellishment than one of replanting to restore the preconstruction condition. The flattening and the warping of roadway cuts and fills into the natural contours, and, under judicious supervision, clean-up of the woods and selective vista cutting are equally important parts of the work.

Plans for maintenance and protection by the Park Service call for operating points at sixty-mile intervals, or in each third park. Management of traffic and ranger patrol of an aggregate boundary of 1,000 miles, along which abut many private holdings, necessarily will develop new problems of administration, certain elements of which will be peculiar to the parkway work. As an

example there is the problem of maintaining parkway lands. The charm of many sections in the Blue Ridge lies in the farm fields and pastures. Should these cultivated areas within the right-of-way itself be allowed to return to forest indiscriminately, many of the fine views would be lost. The Parkway can hardly grow the corn and wheat or tend the cattle in the pastures, and so has resorted to leasing at nominal rentals those parkway lands naturally adapted to cultivation. In this manner the roadside picture will be maintained without cost to the United States and better neighbors may be made of nearby farmers.

The Blue Ridge Parkway is being built under contracts supervised by the Public Roads Administration whose engineers have prepared the plans collaboratively with architects and landscape architects of the National Park Service in accordance with an interbureau agreement. Through a total length of eighty-two miles of national forests there has been a close working together with that Service on the parkway design and operation. Many highway planners familiar with the Blue Ridge country and its cliff sides, chasms, and spur ridges predicted that the Parkway would fall of its own weight when the \$30,000,000 proposal was first made six years ago. Currently, with more than 140 miles opened for traffic, an additional

170 miles in various stages of construction, and with the entire route plotted on survey maps, its completion seems reasonably assured. The character and usefulness of the new Parkway should become definitely known during the next two years as added miles are opened to connect a continuous route from Roanoke, Virginia, to Asheville, North Carolina. As the picture thus comes into sharp focus it can surely be said that the project will afford the tourist an unusual opportunity to view the natural beauty of a country heretofore virtually inaccessible, a country of bold panoramas, wild forests, and exceptionally beautiful flora.

FOREST FIRE PREVENTION POSTER STAMPS

From the National Poster Stamp Society comes the following comment on The American Forestry Association's new forest fire prevention poster stamps: "Permit us to congratulate you on producing your 'Keep Your Country Growing—Not Burning' poster stamps. Such stamps should go a long way in bringing to the public's attention the fact that they should be careful about fire when they are in the great outdoors. By using poster stamps you not only reach a large number of collectors who will keep these poster stamps for years to come, but you will also indirectly influence school children. The National Poster Stamp Society is indeed glad to give you a certificate of approval on this poster stamp and is also arranging to give it national publicity in the next issue of its *Poster Stamp Bulletin*."

Stamp out forest fires with poster stamps! Sheets of 100 stamps are now available at \$1 a sheet from The American Forestry Association, 919 Seventeenth Street, Northwest, Washington, D. C.

FORTY MEN



The Forest Service's original 40-man fire fighting crew—every man an expert

AND A FIRE

LAST summer a brand new occupation came into being in the United States. It is too new yet to have acquired a name, but the term of forest fireman might cover it—fireman used in the sense of one whose sole business it is to put out fires in the big timber. The men of this new calling are picked men, in the most rigid meaning of that old phrase, and trained for the job in the manner of conventional firemen of big cities. In other words, they are professional fire fighters.

For many years, of course, federal, state and private agencies have employed men, thousands and thousands of them, to battle fires in the timber. When a really big fire got going, calls were sent to towns and cities to pick up crews as quickly as possible and send them to the woods. These crews, which were nothing more or less than mobs of men, were recruited largely from the hobo jungles near the watertanks in railroad yards, and from the saloons, cardrooms, poolhalls and lodging houses of the skidroad or bowery districts of the larger cities. Few of them were what you could call ambitious, and many, while glad to pick up a few dollars, didn't really care if all the timber in the world burned up. Worse, most of them were soft of muscle, and hardly knew an ax from a hazel hoe, anyway.

It took a mighty army of such fellows to do much good on a forest fire, even if conditions were favorable; and when humidity was low and the wind high, they might as well have been back in the city jungles as on a fire line.

In more recent years the CCC has been used on fires and the youngsters have been found capable, under much direction, of doing good work, if not too far from traveled roads. But experience has shown a difficulty in subsisting these large crews in inaccessible back-country where many fires start and often get out of hand. The enrollees have shown courage and willingness and have often done heroic work, but they are a bit too young, and even with a few months' training they cannot be said to be experienced woodsmen.

By 1938, the federal Forest Service had come to the conclusion

By STEWART H. HOLBROOK

that the mere massing of untrained men for the purpose of fighting fire was not the best way of going about it. Such crews called for a lot of supervision. Accidents and illness, real or feigned, were prevalent. The cost was high.

Somebody said: Why not a company of men of such calibre that every private in the lot would be capable of rating a captain's commission? Out of this suggestion is emerging the "40-man crew" of the Forest Service—compact gangs of smoke-eating hellions in which every last man is a triple-threat to any fire.

The original 40-man crew was organized and trained on the Siskiyou National Forest, in Oregon and California. Last year it saw enough service on this and other forests to show its possibilities. The results were good enough to bring high official praise from forest supervisors who saw the lads in action. The coming season will doubtless find the 40-man crew established in other regions over which the Forest Service has jurisdiction.

Not just anybody can get into a 40-man crew, for qualifications are such as to keep out all but the most physically fit. Age limits are twenty-one and forty, with some variations permitted in exceptional cases. Unmarried men are preferred, and in any case men must be ready and willing to leave their families at an instant's notice and to be gone all summer if necessary.

Each member must be an experienced woodsman, which means genuine ability with ax, saw and other tools used in fire control work. He must also have the woodsman's qualifications of being half-horse, half-alligator, in order that he may move easily over the roughest ground and through the thickest forest.

He must have excellent eyesight, good hearing and a flawless digestion. His feet and legs must be capable of standing all sorts of punishment, including ground hot enough to sizzle bacon. His heart, lungs and kidneys must function under any conditions. He must have courage. If he is immune to the effects of poison oak and the bites of rattlesnakes, so much the better. Brains are hard to mea-



sure, but high intelligence is called for. The original 40-man crew of the Siskiyou forest was something to contemplate. Its members' average height was five feet, eleven inches. Their average stripped weight was 170 pounds, none of it fat. Their average age was twenty-seven and one-half years. They were in as nearly a perfect physical condition as possible.

The crew contained two qualified first-aid men, two eat (tractor) drivers, three men capable of cooking on the fire line, a radio operator, five powder monkeys who knew how to use dynamite, and ten rough and tough timber fallers who could whale into a six-foot fir snag and fell it in no time at all. Others in the crew were skilled variously in wiring, carpentry, bridge building, high rigging. Every one of them had had his eyes well watered and his skin made tawny by the smoke and fire of more than one forest blaze.

Thus, the forty men were competent to meet almost every emergency commonly faced in the forest, whether the forest be calm and quiet or alive with the crackle and boom of timber burning up. Other crews in training for the 1940 season will be likewise.

These men carry their own "bindles" and rigging. When they start out for a fire each pack contains, among other things, a four and one-half pound bed, a quart of water, and a three-day feed-bag of the condensed and dessicated foods known as "iron rations." No supply train is needed for these fellows unless a fire requires more than three days' work.

When they get to the end of transportation, they get out and walk to the fire; and when they get to the fire they proceed, as one man, to put it out. The crew is divided into four squads, each squad having a straw-boss. A big boss, of course, is in command of all. But the theory of the picked and trained crew—and it has worked out very well in practice—is that teamwork will be almost automatic. Every man is there because he is a real expert at one or more jobs and highly competent in any job that a forest fire calls for.

The original 40-man crew was picked from names carefully selected by supervisors of several national forests in the Pacific Northwest. The men were hired for the season and paid by the month. And while none had to be taught to use ax, saw, or other woods tool, they were trained in some of the finer points of fire control work. They were instructed, for instance, on the subject of weather conditions, such as wind and air currents; on changes to be expected when certain weather factors become apparent; how to best use weather forecasts; and on the fascinating subject of humidity.

They were shown how to determine the size, volume and moisture content of the great pile of fuel that makes up the woods. They were taught how level or steep terrain affects the spread and speed of fire. Natural fire barriers were pointed out. Veterans of many fires drew on their experience to describe the best time of day to attack a fire and the point of attack. If some of the men didn't know it already, they were given a course in backfiring, in making the various kinds of trenches.

The 40-man crew didn't loll around and listen to radio and play cards in the manner of city firemen while waiting for an alarm. In between calls they were used on the Siskiyou forest in bridge building, road building, laying telephone lines and such jobs. And always they trained for fire. Except for his day and night off, which were arranged by a staggered system, every man in the gang had to be within sound of the ranger's siren at all times. The Siskiyou crew served on fires in several forests last summer, and in every case they were at the scene

many hours—sometimes as much as two days—before a pickup crew could have made it. And when they arrived, they proceeded to make fire-fighting history. Using the one-lick method of building fire trail, these picked storm troops went at a blaze with the speed, teamwork and endurance which had been expected of them.

The one-lick style works thus: In the 40-man crew the required number of men are equipped with tools of the right kind and in sequence. The crew falls in behind the boss, keeping six to eight feet apart. Ahead are the ax-men, clearing the trail; after them come men using Pulaski tools, which are a sort of combination ax and mattock. Every few steps each man makes a stroke with his tool, but keeps right on going. Along toward the rear are men with hazel hoes, clearing the ground down to non-combustible soil. Shovelmen complete the trench. Behind them come men who back-fire on the inside of the trench. Lastly is the mop-up crew, taking care of anything not done by the main line. In some cases, men



The captains map their plan of battle. Using the one-lick plan method, they attack a blaze with speed, teamwork and endurance

with back-pack pumps went ahead to cool off "hot spots" and permit work closer to the fire.

The one-lick style is merely the assembly line, suggested by the division of work in automobile and many other factories.

The results of the original superman crew, as indicated, were highly satisfactory. It built five times as much fire line, per man, as the usual pick-up crew; and once built, the men were able to hold twice as much of it. The record, though, was even better than indicated because it was accomplished in face of the fact that the 40-man crew was always sent to what was considered the most difficult sector of a fire.

Get-away time was fast. On occasions of alarm when the crew was in its home camp, the time consumed between alarm and the get-away averaged thirty minutes. When the crew had to be called in from the various jobs it was carrying on, the elapsed time was about an hour. Either is high speed compared to the time required for assembling and dispatching a pick-up crew.

During the 1939 season the 40-man crew was sent to eight fires on five different national forests. The men traveled more than 3,200 miles by motor trucks—and how



Packing rations and equipment on their backs, these forty seasoned woodsmen move into action with amazing speed. On the fire line they do the work of five times their number of less experienced men—and do it with history-making efficiency and dispatch

far they walked will never be known. They built approximately twenty-eight miles of fire-control trench, or line. But these figures don't mean much. The thing that counts is what was accomplished, and the men who know best about this are the supervisors of the forests on which the crew performed.

Supervisor D. J. Kirkpatrick of the Siuslaw National Forest thinks the outstanding advantage is the 40-man's ability to carry its own grub and equipment. Supervisor John R. Bruckart of the Willamette National Forest said there was no comparison in the physique and ability of a pick-up crew and the storm troops. Supervisor K. P. Cecil of the Columbia National Forest used the crew on a fire in terrain that he said would have been impossible for an average crew to cope with. The boys put out the fire. Another supervisor reported that the crew "probably saved a large part of their summer's wages" by their competent action in one fire alone.

The supervisors of national forests are probably as careful of what they say as any men living. When they even intimate that the 40-man crew is the real McCoy, you may be sure it is the McCoy.

But, lest young and strong men think the life of a forest fireman is a bed of moss and cedar boughs, where birds sing sweetly all the day, it should be pointed out that the 40-man crew last summer worked as many as twenty hours on end, without sleep and with only such food as they carried on their backs. This work was done in an atmosphere and in a temperature that would make many men ill within five minutes. It is man-killing work, too, for the pace set is terrific and no woodsman likes to show or to admit fatigue.

The work can be very dangerous at times, even in such a highly skilled crew, for forest fires are filled with intangible dangers that no man can foresee. Moreover, every man packs thirty-six and one-half pounds on his back to the fire, and in the tropic-like jungles of at least the Douglas fir country, that is a day's work in itself for most men, without fighting fire all day and all night.

In short, if the idea spreads and the 40-man crew of forest firemen becomes the factor it now appears likely, I am ready to nominate the members of such crews for the title of America's Most Indestructible Men. They've simply got to be to survive.

REPORTING ON THE TRAIL RIDERS

If you are planning to ride with one or more of the eight expeditions organized for the summer of 1940 by The American Forestry Association for its Trail Riders of the Wilderness, you will be interested in the following developments:

The Great Smoky Mountains Expedition—June 17 to June 25—is closed, the maximum number of riders having been achieved. However, a second trip is being organized to provide for continued interest in the wilderness. This second party will leave Asheville on July 1, returning on July 9. These riders will follow the same itinerary as the first group. Organization and cost, of course, will be the same—\$100 from Asheville.

On the Spanish Peaks - Hilgard Expedition in Montana, the cost to the riders has been reduced from \$150 to \$135 from Bozeman back to Bozeman. This saving is made possible by completing new packing arrangements.

Expedition No. 4—Wind River Wilderness, in Wyoming, July 18 to July 31—has been cancelled because of packing complications which make it impossible to provide, at a cost consistent with expeditions in other regions, the necessary high standard field organization.

Just as a reminder, the first expedition is scheduled to leave Asheville, North Carolina, on June 17 for nine days in the Great Smoky Mountains, with a second party following the same itinerary on July 1. The second expedition will leave Sun Valley, Idaho, on July 15 for fourteen days in the Sawtooth Wilderness. The third expedition will get under way on July 18 from Bozeman, Montana, for thirteen days in the Spanish Peaks-Hilgard Wilderness. On July 29 riders will gather at Silver City, New Mexico, for a thirteen-day trip in the Gila Wilderness. On August 2 the first of the two fourteen-day Colorado trips will get under way from Glenwood Springs, exploring the Maroon Bells - Snowmass Wilderness. The second Colorado trip, beginning at Glenwood Springs on August 18, will explore the White River Wilderness. Then on August 23, the fourteen-day trip in the Kings River Wilderness of California will get under way from Bishop.

As the parties are filling up—make your reservations now.



Ancient Dutch map of Brazil, showing the Pernambuco coast. Note the Indians felling trees. Brazil-wood was first shipped in quantity from this section and was often called "Pernambuco wood."

THE TREE THAT CHANGED A COUNTRY'S NAME

By ELSIE A. PARRY

INCONSEQUENTIAL things, like the pea in the Princess's bed, are often at the bottom of eventful circumstances. The early Portuguese explorers, coasting hopefully along the eastern coast of South America, gazed at the forests and lush tropical vegetation with disappointed eyes. Gold and silver and precious stones were what they were looking for, not the flora, undeniably luxuriant though it was, of this vast raw region that had the additional disadvantage of being infested with human flesh-eating Indians. And yet a single tree, growing in anonymous splendor on the great Brazilian plateau, was destined to change the name of the land to which it is native and to supply, for almost a century, the sole reason for whatever interest Europe took in that wild country, so grandiosely baptised by its discoverer, Cabral, as Santa Cruz, the Land of the Holy Cross.

From Santa Cruz to Brazil in six moves. . . . It sounds like one of those popular modern word puzzles! Actually the change came about quite without intention—as so often happens—and was the cause of righteous

protest on the part of Church dignitaries, who claimed that "the alteration was due to the agency of the Devil, Brazil being a name given without consideration by the vulgar, who are not qualified to name the possessions of the Crown. . . ." Whatever the merits of the case, the name Brazil stuck. Robert Southey in his *History of Brazil* even goes so far as to maintain that "both for the sake of geography and euphony Brazil is to be rejoiced at." For the sake of economics and simple justice as well—for it was the *pão Brasil*, Brazil-wood, that placed Santa Cruz on the economic map of the sixteenth century. Outside of monkeys and parrots, it was the first article of commerce from Portugal's new colony to reach the Old World. Compared with the expected cargo of gold and diamonds, the shipload of red logs was unromantic enough, but at least it was useful. How useful, time was to tell. . . .

Unfortunately, we do not know whose discerning eye it was—history is often lamentably silent on such points—that first singled out the *pão Brasil* from the closely-ranked legions in the tropical forests of Santa Cruz. At

any rate, the wood was recognized as being similar to a certain red dyewood from the East Indies, long popular in Europe. This Oriental wood, said to have been known as early as 1198, now called "Indian Redwood," yielded a dye that was *brazza* or fiery red, so named from *brasas*, coals. Chaucer mentions it in "The Nonnes Preestes Tale":

"Him needeth not his colour for to dien

With Brasil. . . ."

The discovery of a dyewood in the New World was opportune. It seemed to be plentiful and certainly the trip across the Atlantie was shorter and less hazardous than the long jaunt to the East. Small wonder, then, that the Portuguese made the most of this economic plum that had been so casually dropped in their laps. In the sixteenth century whole fleets of Portuguese ships came to Santa Cruz for the valuable wood. The section came to be called the "Brazil Coast" and in time "the whole country obtained the name of Brazil, as we say the Gold Coast, the Slave Coast, the Sugar Islands. . . ." So important was the dyewood trade that it was taken over as a royal monopoly.

It is time to take a closer look at this remarkable tree which has got itself into the history books. *Caesalpina brasiliensis*, or *echinata*, is as interesting botanically as it is historically. An early eighteenth century chronicler of South America goes into detail concerning its qualities:

"The brazil or red-wood, is cut from a tree, some-

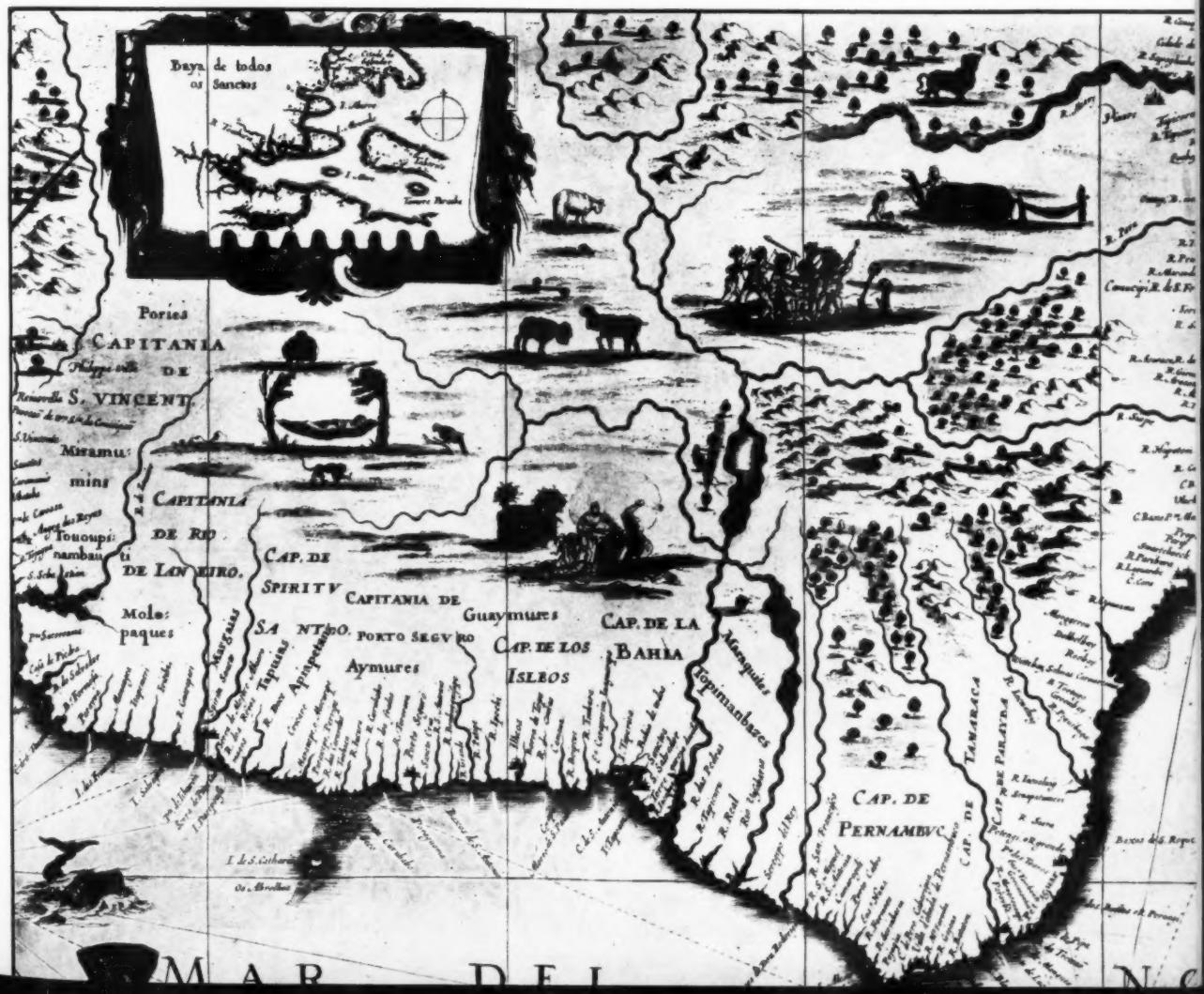
what like the English oak for largeness and foliage; being hard to fell and split, which is done by negro slaves, who are also obliged to bring it to the sea-side on their shoulders. This wood is very heavy and dry: it crackles much in the fire and raises little smoak: it should be chosen in thick pieces, close, sound, and without any bark on it: but from a pale colour, upon splitting, it becomes reddish and has a sweetish taste when chewed. It is used by turners; as also to make a kind of carmine, by means of acids; and a liquid lacca, for miniature: however, the principal use is in dying, where it serves for a red colour, though it should not be used without alum and tartar. . . ."

More than a century earlier John Nieuhoff, who travelled extensively in Brazil between 1640 and 1649, had found *Caesalpina* worthy of note:

"The stem or trunk of this tree is knotty, of a very agreeable scent, and sometimes two or three fathoms thick; its leaves are dark-green and small, thorny at the end, and grow on small stalks; the bark, which is about three inches thick, is generally taken from the trunk before it is fitted for sale. . . . Most of the trees grow about 10 or 12 leagues from the sea-side. . . ."

Of course Europeans were not the first to discover the merits of Brazil-wood. The native Tupis, who, despite their predilection for human flesh, were by no means unintelligent, called the tree, "for its excellency's

Another ancient map, picturing activities of the daily lives of the savage Tupe Indians, the aboriginal inhabitants of this part of Brazil. In the 16th century, whole fleets of Portuguese ships came to Santa Cruz for the valuable wood that changed the country's name. From "Nieuwe Atlas of Wilhelm and Joan Bloev, circa 1629 A.D."



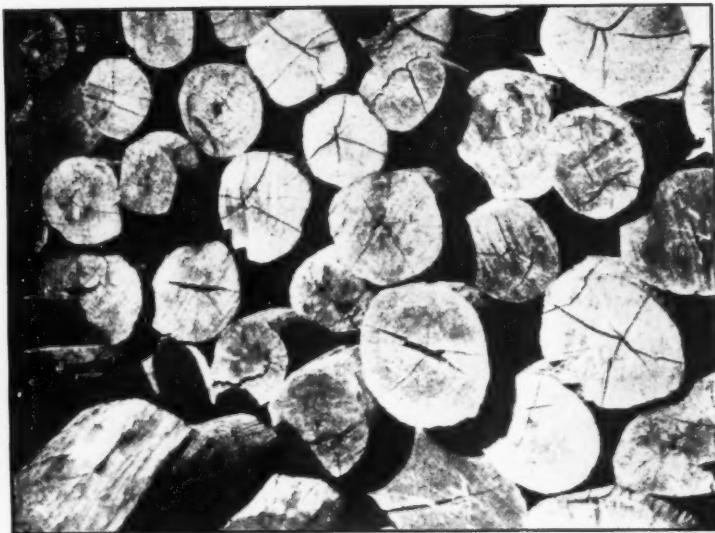
sake, *Ibirapitanga*." But the Indians were entirely unable to comprehend the enthusiasm with which the white visitors to the coast carted away whole ship-loads of the hard heavy wood.

"How is it," said an old Tupinamba to De Léry, who traveled and recorded his travels with equal diligence, "that you Mairs (Frenchmen) and Peros (Portuguese) come so far to fetch wood?

Have you none for burning in your own country?"

"Plenty," answered De Léry, "but none of the same kind as yours; and we do not want it for burning, but for dyeing, just as you dye your cotton cords and your feathers."

"But," rejoined the Indian, "why do you want so



Pernambuco Logs—one of Brazilwood's many aliases, and said to be the wood for violin bows

much of it?"

"In my country," answered De Léry, "one man buys all the wood which the ships carry home; in addition he has more red cloth, more knives, more scissors, and more looking glasses than are in all Brazil."

"Wonderful!" cried the Tupinamba. "And this man, does he not die?"

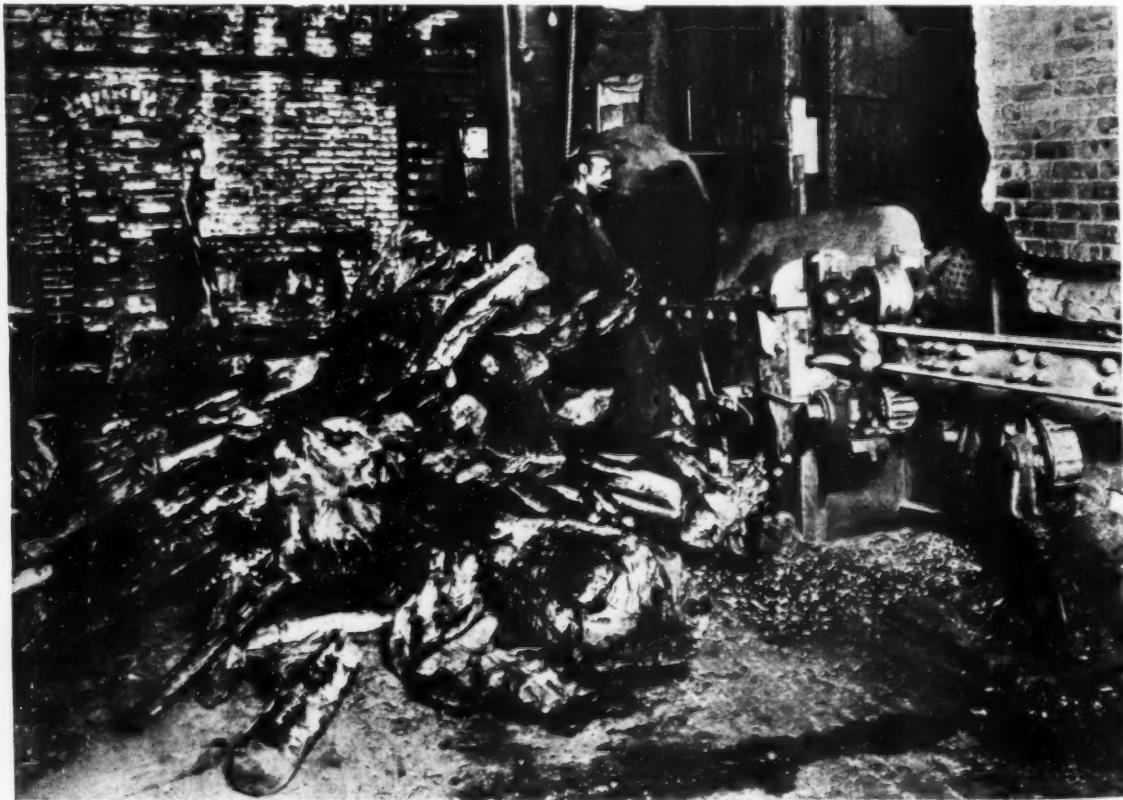
"Certainly," replied De Léry, "he dies like other men."

"And who has

all that he leaves behind him?"

"His children or his nearest kin," De Léry said.

"Truly then," quoth the Tupi, "you Mairs are remarkable fools. For, why should you endure all the hardships you tell us of in crossing the sea, to get these things for your children? The same earth which supports you also



Chipping Brazilwood in preparation for the extraction of the dye, at an American plant at Chester, Pennsylvania

Courtesy, American Dyewood Company

supports them when you are gone. So it is with us and with this we are contented. . . ."

This Indian philosophy has its points!

At any rate, the story throws light on the greed of the Europeans, who recklessly stripped the virgin forests of Brazil-wood in those halcyon days when conservation was an idea yet unborn. The great demand for the dyewood gave rise to a situation that was to affect profoundly the course of Brazilian history: it led to the development of slavery.

The Portuguese in Brazil had small interest in heavy manual labor — swashbuckling adventure was more in their line. But, unfortunately, the Brazil-wood which was to make their expeditions to the New World financially worthwhile grew some thirty miles inland — and not only inland, but also high up on the Brazilian tableland, which was separated from the coast by a practically unbroken range of mountains. Roads were, of course, nonexistent and so were pack-animals. But there were Indians . . .

The Indians, however, developed a curious and active aversion to being turned into beasts of burden. The Portuguese, for all their ingenious methods of refined torture, found the natives hard to domesticate. African negroes proved more amenable. The black men, brought to the coast by thousands in the "hell-holes of the slave trade," were set to lugging down the Brazil-wood logs from the plateau to the shore — long lines of sweating humans stumbling along in the tropic heat, weighed down by heavy balks of red wood. It turned out to be an excellent economic arrangement for the Portuguese! When the demand for Brazil-wood fell off and the sugar plantations began to thrive, the blacks were there to do the work. Later, with the discovery of gold and diamonds, they were turned into the mines.

Several varieties of Brazil-wood, all lumped together under that name, were shipped to Europe long before the

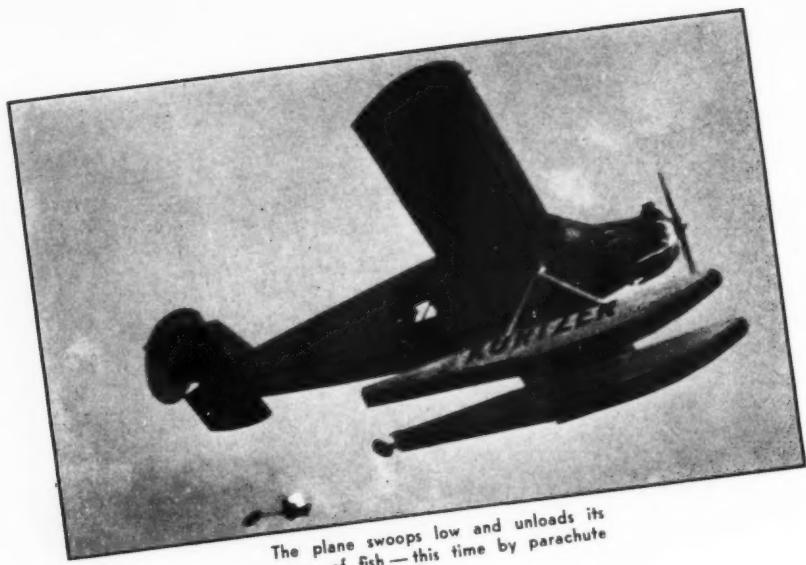


Identifying characters of Brazilwood — flowers, leaves, fruit and seed. From Chaumeton's "Flore Medicale" — Paris, 1815

trees were described botanically. Later they were differentiated under such geographical designations as Pernambuco, Fernambuco, Para, and Bahia wood; still later the original name *Brasil* was corrupted to brasilette, brasilletto, and the like. But whatever their names, the trees produced similar dyes — from the heartwood only — varying in color from yellow and yellowish red, to crimson. The addition of an acid turned the coloring matter yellow or orange, depending upon the quantity of brazilian in the wood; the addition of an alkali turned it crimson red. To quote a nineteenth century commentator: "Brazil abounds in valuable woods . . . among them the Brazil, from which an elegant dye is extracted; and, it is said, the color will last as long as the material." No wonder European dyers clamored for Brazil-wood! In those days when fashions did not change over night, garments were expected to give years of service and the color was expected to retain its brilliance as long as the fabric

held together, — and it usually did so.

Today synthetic dyes have largely displaced the old favorites — "Fustick, Speckled Wool and Brazil," as Dampier called them — and Brazil-wood, *per se*, is very little known to the present generation of dyewood dealers in the United States. The Brazil-wood of our trade, says Samuel J. Record, the tropical wood expert, now comes exclusively from the west coast of Nicaragua, and is *Haematoxylon brasiletto*, full brother to Logwood (*Haematoxylon campechianum*). Apparently a difference of one atom in the molecules of the color principles makes the distinction between the two. The coloring principle of Brazil-wood occurs in several genera and that is why so many woods are called Brazil. But no modern dye vat can reproduce the old romantic associations that cluster around Brazil-wood, which changed the destiny of half a continent.



The plane swoops low and unloads its cargo of fish — this time by parachute

MORE FISH FOR THE BACKWOODS ANGLER

By EDNA N. SATER

"HUNDREDS of little fish—cat, perch, trout, etc.—fell during a heavy local shower and were afterwards found swimming in pools between the cotton rows." This report by J. W. Gardener, voluntary weather observer of Tillers Ferry, South Carolina, in June, 1901, could be coming from any number of localities these days. But not as the result of a weather phenomenon such as he recorded. The modern "showers of fishes" are completely man-made, descending from airplanes used for planting fish in lakes in remote mountainous regions.

This rather spectacular operation is the latest device of the federal Bureau of Fisheries to keep these back country lakes stocked for the hardy fisherman. Heretofore accessible only by means of pack horses, the process of stocking them has been difficult, costly and not always successful. The time involved in horsepacking cans of fingerlings over many miles of rugged trail often resulted in heavy

losses even before the fish were planted in the lakes. With such a low rate of survival, the operation was extremely costly and, in some areas, ineffectual.

To those faced with this knotty problem, aircraft seemed to offer the logical solution. Its use would reduce to minutes the long hours required for horse packing, thereby reducing if not eliminating altogether fish losses between the hatcheries and the lakes. With this

saving in fish and hours, it was reasoned, costs could be materially reduced — more lakes would be stocked. The big question was whether or not the young fish could be dropped from airplanes into the lakes without serious injury.

Experiments followed. Using hydroplanes, the Bureau of Fisheries in cooperation with the Washington Fish and Game Department, poured several cans of fingerlings, about three and a half inches long, from a plane flying eighty miles an hour and at an altitude of



Attaching parachutes. The cans are successfully dropped from an altitude of 250 feet by a plane flying eighty miles an hour

250 feet. The test was successful. Examination of the lake revealed no dead or injured fish. The little fellows were swimming around, working out into deeper water in the same manner as if planted from the shore. In a second test the cans were dropped by parachutes, the fish escaping through holes cut in the top of the cans. This also was successful.

In the great Sawtooth Mountains of Idaho are many lakes that can be reached only by pack horses. Because of their great distance from roads, it is practically impossible to keep them stocked. Fishermen get to them without trouble, but few trout can survive the long pack trip overland. So into this region the Bureau of Fisheries moved its aerial fish planting experiments.

In cooperation with the federal Forest Service, the Idaho Fish and Game Commission and the Frontier Club, the tests were carried out from the government hatchery at Hagerman. A special tank was constructed for the hydroplane so that the water for the fish could be aerated. This was achieved with a pump powered by a small windmill that whirled in the slipstream from the plane's propeller. Furthermore, a gate was built in the bottom of the tank so that its load of fish and water could be dumped by lever action.

The Idaho experiments proved to the satisfaction of those engaged in them that 5,000 fingerlings can be safely carried for thirty minutes in these specially constructed tanks. This is sufficient, as the average time for a round trip to the back country lakes was but twenty minutes. It was also found that fish could be dropped from an altitude of 500 feet without injury. Furthermore, the operations did not prove costly. The cost of charter of the plane was \$20 an hour, or approximately \$10 a round trip including time for re-



A happy landing. The fish escape through holes cut in the top of the can. In other experiments, fish were dumped into the water from heights of from 250 to 500 feet

loading. All told, the Idaho operation planted nearly 80,000 fingerlings in the back country lakes, 60,000 of which were eastern brook trout, 14,000 three-inch rainbow trout, and the remainder five-inch rainbow trout.

While these experiments are breaking ground for more extensive fish planting by airplane in our rugged conti-



Checking results. No dead or injured fish were found, indicating complete success. Nearly 80,000 fingerlings, up to five inches long, were air-planted in Idaho lakes

nternal back country, airplane planting of fish was undertaken by the Bureau of Fisheries in Alaska in 1931. At that time the eastern brook trout was introduced into barren lakes in the vicinity of Ketchikan, Wrangell, Petersburg, Red Bluff and Juneau. The distribution was made by chartered airplanes from Juneau, where they were brought by boat from the Yes Bay hatchery. Because of the size of most of these lakes, which permitted safe landings for seaplanes, the methods of planting were greatly simplified. When the planes came to rest on the surface cans of fingerlings were merely poured into the water, just as they would be from land.

Following the successful planting of eastern brook trout in Alaska in 1931, a further extension of the range of that species was undertaken in 1932 when 36,000 fingerlings were distributed to eleven interior land-locked lakes in southeastern Alaska. As before, the trout were hatched and reared at the Yes Bay hatchery. Seaplanes were again used to distribute these fish to Manzanita Lake, Grace Park, Perseverance Lake, and Mahoney

job. The bulk of the distribution is done by more prosaic methods.

Three especially equipped railroad cars are operated by the Bureau of Fisheries in connection with fish distribution from its 110 hatcheries located in the various states. These cars annually travel approximately 50,000 miles, stocking public waters in virtually every section of the country. They are of the Pullman type and travel in passenger trains. Deliveries are made to applicants while the train makes its customary stops to receive and discharge passengers. The cars are equipped with both steam and electric air compressors for forcing air into fish containers to renew the supply of oxygen in the water. The fish are carried in insulated compartments.

Most of the Bureau's hatcheries are now using automobile trucks to make deliveries of fish. These are fitted with racks enabling them to carry loads of from forty to 100 fish pails. The Bureau also operates a small fleet of tank trucks carrying the same provision for aeration as the fish cars. Thousands of miles of streams in the national forests have been surveyed by the Bureau and a stocking program has been completed.

Through an agreement with the Forest Service, this program will be followed as closely as possible, emphasis being placed on the provision of good fishing as one of the recreational features of the forests.

In the past the national parks as fish preserves have not been given the consideration to which they are entitled. Recently, however, the Bureau has established stations in Yellowstone, Glacier and the Great Smoky Mountains Parks. Skilled fish culturists are assigned to make collections and incubate eggs of the various species, the re-



The old method of stocking remote lakes by pack horses, as shown above, is costly and often unsuccessful. Many fish die enroute. The airplane, in twenty minutes, can safely plant more fish in the rugged back country than can pack horses in two days.

Lake in the Ketchikan region, as well as to Lake Haselburg on Admiralty Island.

Since the Bureau of Fisheries neither owns nor operates its own planes, it cooperates with state agencies in planting experiments by supplying the fish for stocking, and by having its representatives act as advisors and observers. While the Bureau utilizes airplanes in maintaining aerial patrols over our fisheries in Alaska, such plane service is handled entirely by contract with private companies.

The Canadian Government has also experimented extensively with airplane fish planting. An article on this subject, printed in the *Transactions of The American Fisheries Society for 1938*, demonstrates that Canada has found it possible to drop young trout, from three to five inches in length, from an airplane flying at an altitude of 100 feet or more, without any ill effect either from the descent or the shock of landing. The cost per mile is estimated at thirty cents, with a plane capacity of 600 pounds.

While airplane planting of fish is spectacular, it is only one method that is used in doing a small part of a big

sultant fry and fingerlings to be liberated in the waters most suitable for them.

The Bureau's contacts with the Forest Service and the National Park Service are governed by definite agreements whereby stocking and other activities on the lands under their control are performed in conformity with a mutually agreeable program.

In brief, where there has been developed a program of recreational use for federal lands, and angling has been a part of the program, the Bureau of Fisheries has entered the picture as the principal federal agency capable of providing such angling.

In utilizing the airplane to keep remote, back country lakes stocked with fish, the federal government is merely following the method of progressive anglers who fish in them. More and more is the airplane being used by sportsmen as a quick means of reaching these wilderness waters. This is particularly true in Alaska. There the angler can leave his home in the early morning, enjoy a day of exceptional sport, and return in the evening from a trip that would represent several days of travel and physical hardship if made overland.

EDITORIAL



CONSERVATION AND PEACE

GIFFORD PINCHOT, in an address before the Eighth American Scientific Congress in Washington, D. C., on May 11, made a proposal that is so pointedly timely it should have world-wide standing as the conservation editorial of the month. We are making it ours by quoting it in full. The proposal rightly received the approval of the Congress which took steps to establish an International Conservation Commission to represent all the Americas.

After reviewing the beginning and spread of conservation, dating from before the Conference of Governors in May, 1908, called by Theodore Roosevelt, Mr. Pinchot told of plans made then and during the next year for a world conference on natural resources. The elder Roosevelt, believing that international cooperation in dealing with natural resources would work powerfully against war and for permanent peace, sent invitations to fifty-eight nations to meet in the Peace Palace in The Hague in September, 1909, but the meeting was circumvented by change of Administration. Continuing, Mr. Pinchot said:

"National life everywhere is built on the foundation of natural resources. Throughout human history the exhaustion of these resources and the need for new supplies have been among the greatest causes of war.

"A just and permanent world peace is vital to the best interests of all nations. When the terms which will end the present war are considered, the neutral nations should be in position to assist in finding the way to such a peace. That being so, it would be wise to prepare in time.

"The proposal is that the nations of the Americas prepare now for an endeavor to bring all nations together, at the right moment, in a common effort for conserving the natural resources of the earth, and for assuring to each nation access to the raw materials it needs, without recourse to war.

"In all countries some natural resources are being depleted or destroyed. Needless waste or destruction of necessary resources anywhere threatens or will threaten, sooner or later, the welfare and security of peoples everywhere. Conservation is clearly a world necessity, not only for enduring prosperity, but also for permanent peace.

"No nation is self-sufficient in essential raw materials. The welfare of every nation depends on access to natural resources which it lacks. Fair access to natural resources from other nations is therefore an indispensable condition of permanent peace.

"War is still an instrument of national policy for the safeguarding of natural resources or for securing them from other nations. Hence international cooperation in

conserving, utilizing, and distributing natural resources to the mutual advantage of all nations might well remove one of the most dangerous of all obstacles to a just and permanent world peace.

"Since the American nations are less dependent on imported natural resources than European nations, and since they are already engaged in broadening international trade through negotiated agreements, their initiative to such ends would be natural and appropriate.

"The problem of permanent peace includes, of course, great factors which the foregoing proposal does not cover. But it does cover that factor which is certainly, in the long run, the most potent of them all.

"If the foregoing proposal is adopted, facts in support of it will be needed, and a plan for assembling them. The formulation of a general policy and a specific program of action would follow.

"Facts for each nation separately, for groups of nations, and for the whole world might well be assembled under the general classes of forests, waters, lands, minerals, and wildlife. In brief outline they should include:

"As to conservation-resources in existence, consumption, probable duration, waste, conservation if any, necessary reserves, and available surplus.

"As to fair access—present interdependence of nations in natural resources (raw materials), with the origin, destination, and quantities of imports and exports present barriers to fair access; and sources of pressure upon nations to acquire natural resources.

"The information just outlined undoubtedly exists in sufficient detail for the present purpose, and can be put together without original investigation. It could well be done through a commission appointed for that purpose representing all of the American nations.

"The gathering of information through the creation of such a commission might, I believe, properly be recommended by the Eighth American Scientific Congress to the governments of the American nations.

"Formulation by the commission of a plan and of recommendations to the American governments for a general policy and a specific program of action, including the presentation of the plan when prepared to neutral and belligerent nations, would follow.

"Such a commission would be of immense and lasting value to the American nations. It could not but advance their interests, both individual and mutual, in addition to opening a road toward a workable basis for permanent peace.

"Finally, the situation in Europe and in Asia suggests that action for the purpose outlined above was never more necessary than at present."



The ranger points out the trail to youthful hikers

ONE HUNDRED boys sat in a semi-circle around a red forest fire truck of the New York State Conservation Department. Gray blankets were draped around their young bodies to ward off stray mosquitoes and cool evening breezes of the Adirondack Mountains. There was silence as a forest ranger mounted the truck, settled himself on a milk-can of water and began talking about the forests.

These youngsters were so-called underprivileged children from every section of New York City—from teeming, noisy, hot streets of the East Side, Hell's Kitchen, Harlem, Red Hook and the Bronx. They had journeyed 250 miles into the Adirondacks to spend three weeks at Fox Lair, the 1,200-acre camp of the New York City Police Athletic League.

The forested mountains were a revelation to the boys, virtually none of whom had ever before been away from city environments. Although housed in the buildings of a once famous show-place of the Adirondacks, the estate of the late Richard Hudnut, the boys were living in a real wilderness. Surrounding them were endless miles of state-owned forests and mountains, abounding in fish and game.

During the past three years 170,000 children in New York City have joined the Police Athletic League. That number is equal to approximately half the total population of Vermont or twice that of Nevada. The purpose of the league has been to supervise the recreation of children and thereby cut down juvenile delinquency.

In the old days of not so long ago youngsters from the poorer districts were constantly finding themselves in serious scrapes with the law. Thoughtless rather than malicious, they broke windows, swiped fruit from pushcarts and stole candy; suddenly found themselves haled to court and later mingling with a motley crew of prisoners awaiting trial in jail. It was only another step before they became criminals.

Today that picture is changing. Instead of fearing the police and revolting against law and order, the youngsters are beginning to look upon them as friends,—persons who organize athletic contests in city playgrounds and block off play streets for games of shuffleboard, paddle tennis and volley ball. And then two years ago when Mrs. Hudnut donated Fox Lair to the League, the neediest of the youngsters were enabled to look to the police for a real vacation.

RANGER RIDES

At Fox Lair, the New York City Police Camp for Underprivileged Boys

Fox Lair is surrounded by miles of state-owned forest wilderness. Its 1,200 acres include a thirty-room mansion, four eight-room houses, two barns and numerous other buildings. During the experimental summer of 1938, some 120 city boys averaging about thirteen years of age had the run of the place. Last summer the number was increased to almost 350, the boys attending in three groups.

The expenses of operating the camp, except the salaries of workers assigned by the recreation department of the WPA, are met by the Police Athletic League within the limits of its funds. Most of these funds come from the annual show "Around the Clock," which is produced in Madison Square Garden by the New York Police Department. The remaining funds come from private contributions. Expenses have been so pared that \$100 will send twenty children to Fox Lair for a week.

The Police Athletic League campers on arrival at Fox Lair are divided into tribes of eight and assigned to leaders, known as chiefs. The program is directed toward acquainting the young Indian braves with those experiences little or never before known to them, such as hiking and overnight camping trips, nature study, nature craft, camp craft, swimming, boating and cooking. In addition, various jobs such as policing grounds, taking care of dining halls, washing dishes, cutting wood and other camp chores are assigned to each tribe and rotated daily.

John H. Morris, sixth deputy police commissioner, said of the boys last year they were definitely benefited physically, mentally and morally by camp life. "These youths," he added, "have a new idea of the value of things. Crowded tenements, paved streets and the noisy environment of city life are no longer the only goal they can hope to reach. They have gained their very first contact with nature."

The forest ranger told the blanketed boys in the semi-circle he would like them to write essays on why they

By

ARTHUR G. DRAPER

Photographs by New York State Conservation Department

thought New York had adopted the slogan "Prevent Forest Fires—It Pays." He said there were no rules and they could write as much as they wished, preferably in the form of letters home to parents. The winner was to receive a jack-knife. All the ranger wanted to do now was to give the boys a few suggestions about conservation.

Like the majority of people, the boys were unaware of New York's wilderness resources. They thought Fox Lair was just an oasis in the midst of a vast industrial state. And yet in the Adirondacks alone New York owns more than 2,000,000 acres, an area almost as large as Yellowstone National Park, the largest of the parks. Adding the state-owned part of the Catskills, the whole forest preserve is considerably larger. With this unique eastern wilderness within a comparatively short driving distance of half the population of the country, administration becomes a major task. Not the least of the problems by far is that of forest fire control.

With this introduction the ranger rambled along. He forgot the few notes he had jotted down and told the boys how fires are put out, how they destroy the beauty of the forests, burn to death the game, spoil the fishing, open the way for insect attacks, ruin valuable timber crops and eventually lead to soil erosion and floods.

He asked them to be tidy around camp with old papers and tin cans because a messy forest is no more attractive than a messy city. But, especially, he requested them to be careful in the woods with matches, to clear a space for campfires, to build small fires and then, when ready to leave, to be sure the fire was out, throwing water and dirt on it.

Slightly hoarse from talking loud and long, the ranger suddenly thought he might better have stuck to his brief notes and finished with a longer display of fire fighting tools and a demonstration of the fire pump. That would

have been more spectacular. After all, these were city boys, all under sixteen, far away from their public schools and most likely in no receptive mood for a long lesson on the social and economic benefits of conservation. He was afraid he had bored them.

Nevertheless, although hesitatingly, he asked if there were any questions. Hands shot up. Questions were fired thick and fast, some serious, others facetious. These were city boys with none of the proverbial shyness and restraint of their country brothers. "What do you have to do to become a ranger?" "How old do you have to be?" "What kind of graft do you get?" "How long would it take to climb Black Mountain?" "What do you do if there are two fires at the same time?" "What do you do if your telephone line breaks?" "How do you get men to fight fires?" "What happens when a fire starts at night?"

Still answering questions, the ranger packed up, hopped into the cab of the truck and gave a departing salute to the boys with a lusty whine of his siren. A few days went by and he had qualms about any essays being written. Exploring the woods, swimming, discovering animals, playing games, surely all these activities were much more interesting than writing essays on conservation. But then a day or so later Lieutenant Eugene McGillicuddy drove up and handed over forty essays.

Forty out of a possible hundred-odd essays was a rather satisfactory return, thought the ranger. Furthermore, all the essays were earnest and serious in an effort to promote conservation. These youngsters were having the time of their lives at camp and they were not going to have some careless person burn the woods and perhaps destroy all chances of forest recreation.

It is safe to venture the statement that these so-called underprivileged boys will make good and careful woodsmen, proud of their nation's natural resources. It was no particular persuasive power of the ranger, only the fact the boys were impressionable and that a new line of thought had been brought to their attention.

In contrast to the Police Athletic League boys take another group at a neighboring summer camp. Here the parents pay substantial camp fees, which would seem to take the boys themselves out of the underprivileged category. Yet, when some of these boys climbed Gore Mountain to visit the observation tower, they left behind broken windows and a litter of paper.

The chances are no one had ever spoken to the boys about tidiness, let alone tidiness in the woods, and a regard for property. It meant nothing to them that some one would have to clean up their litter and carry a new window pane up the mountain trail. It's doubtful whether the Fox Lair boys would have behaved that way.

Up to now public education by the Conservation Department in New York has consisted, in part, of exhibits, moving pictures, talks by the administrative staff and press releases. In the field, observers in fire towers have been urged to impress visitors about the need for care with fire while in the woods. It is a new departure for rangers to give informal, little conservation lessons to such juvenile groups as those at Fox Lair.

All the ranger did at the Police Athletic League camp was to recite to the gray-blanketed boys some of his own experiences and observations. The youngsters, imaginative and alert, were already would-be Indians, trappers and Daniel Boones. It wasn't much of a jump for them to become fire fighters and conservationists. Having focused their eyes on the value and beauty of forests, they quickly learned to march in step with nature. Pulling out of camp in his little red fire truck, the forest ranger had a strange thrill of satisfaction as he heard the boys shout, "Hi yo, Silver. The Lone Ranger rides again."



Camp Lair boys receive a lesson in forest fire prevention

JUNE, 1940

OREGON OAK—TREE OF CONFLICT



By

W. F. McCULLOCH

An arboreal octopus —
magnificent son of conflict,
illustrating the fantastic
branching often found in
these fighting trees

Photograph by
Oliver P. Matthews,
used by courtesy of
Willard Ayres Eliot

OREGON oak is a hardy pioneer, a broadleaf impertinently battling for existence in a territory which by all ecological criteria is the exclusive domain of conifers. The tree is short, squat, frequently gnarled, occasionally beautiful, and always tough. Saw down (with much perspiration) an Oregon oak. Buck it up (more perspiration) into short lengths. Then attempt to chop it. The wood will spit the ax right back at you. That's how tough it is.

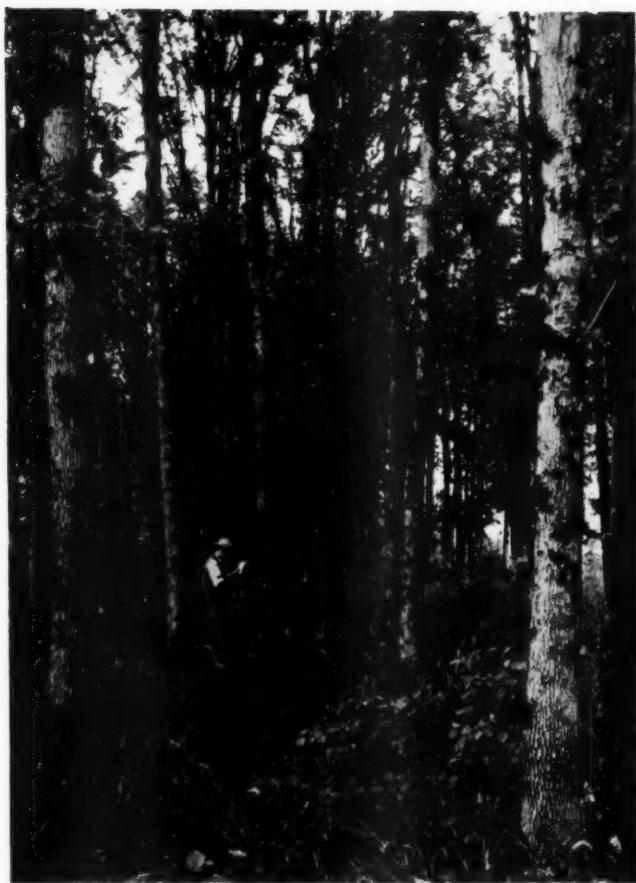
This fighting tree, *Quercus garryana* Douglas, extends from southwestern British Columbia through western Oregon and Washington into the coast ranges of northern and central California. A lone grove of oak is also found on the northern end of Vancouver Island, vigorously asserting itself although more than one hundred and fifty miles above the limits of the main body of the species, and by long odds the most northerly oak stand on the continent.

The best physical development of the tree is found in the Willamette Valley of Oregon. Here it may reach a height of seventy-five or eighty feet, with diameters varying from one and a half to three feet. Exceptional trees have been found up to ninety feet in height, with diameters from five to six feet. Oak is one of the important hardwoods in the northwest. Ranked in order of volume the hardwoods are: red alder, bigleaf maple, Oregon oak and Oregon ash.

Oak is found most frequently in the zone between grassland and stable forest, the so-called tension zone where different types of vegetation struggle for existence. Tension is an apt expression. The oak is so beset by enemies that it never gets a chance to relax. Approach it with an ax and it will snap at you.

Some trees are like spoiled brats or football heroes—everything is optimum for them. Not so the oak. Various detrimental influences work on it: man, harvesting it for commercial purposes or roasting it with grass fires; grass itself, resisting encroachment; adverse habitat; fungi; mistletoe; insects—eating the leaves and gnawing the branches; and Douglas-fir. Oak successfully combats all but the last, and in this case it is only through its own hospitality that it is undone eventually.

Oregon oak is excellent firewood, clean, long burning, with a fuel value (dry) equal to ninety-seven per cent of that of a ton of coal. It is nearly comparable in quality to the eastern



U. S. Forest Service

Oregon oak at its best—this is the interior of an oak forest about eighty years old



R. M. Evenden

white oak, and hence of considerable commercial importance. This is unfortunate for the oak because it is heavily cut for handle stock and furniture as well as fuel. However, the tree makes a good comeback. It coppices vigorously and the year after cutting a whole host of sprouts will appear. In some cases it has been desirable to remove oak from an area. Since you can't cut it off successfully, the most effective means of destroying the tree is to girdle it, cutting through the food transporting tissue of the outer bark. As a result, the roots are unable to obtain manufactured food from the leaves and the tree will die. Most trees die with gratifying promptness but the oak hangs on for three or four seasons, and should you leave just the smallest sliver of cambium intact, new bark will bridge across the cut

Invasion — the struggle is on. While Oak has succeeded in retrieving a small piece of ground from the grass, young Douglas Fir in turn is pirating the site

and in a short time the tree will be growing with all its old vigor.

About 1880 settlers in the Willamette Valley were caught totally unprepared by one of the heaviest snowfalls in the history of the region. Little or no hay had been stored, for the expectation was that livestock would range out all winter as in previous years. Large quantities of feed were required immediately if cattle and horses were to be saved. In this dilemma the settlers turned to the only native species which was sufficiently palatable and sufficiently abundant to meet their needs. Which species? The Oregon oak again. A great many trees were cut down, stripped of tops and branches, even fairly large limbs, in order to provide food for the starving cattle.

There is no record of the effect of this arborescent diet upon the cattle, but the effect on the oak was disastrous. A good deal of the timber felled for feed was utilized for wood after it was down, but many truncated boles still lie in the woods, indicating that the toll of oak must have been heavy. The continued resistance to decay since 1880 shows that even when down, the oak is not out.

Characteristically the oak is distributed upon the poorer forest sites; southwest exposures which almost sizzle in the summer; steep slopes where run-off is excessive; thin-soiled areas with frequent rock outcrops. Comparatively, its other broadleaf associates, Oregon ash and bigleaf maple, are simply sissies. They grow only in moist stream bottoms protected against summer's drought, or in deep rich soil in sheltered valleys, but the oak will tough it out on exposed ledges where the rocks are so hot that you cannot stay your hand upon them. Where site conditions become so severe as to limit extension of the forest, all its associates give up, but the oak still hangs on.

A climatic constant in the Northwest is a very wet winter followed by a very dry summer. In regions where the oak is native, thirty inches of rainfall have been recorded in a single month of the winter, followed by as many as 120 practically rainless days in summer. The

winter condition is not serious but the dry summer has a devastating effect upon forest growth.

The oak is equipped to meet these adverse conditions in two ways: through leaf modification and through rooting habit. Oak leaves are not succulent; rather they are leathery, with a thick-skinned exterior which effectively limits water loss. The stomata or pores of the leaf have an extra protection in a covering of fine hairs which likewise assist in reducing water loss. With these adaptations, Oregon oak can endure a mild drought without injury. The acorn is a type of seed which contains an ample quantity of food to nourish the embryonic plant until it is able to dig for itself. Under the stimulus of this adequate food supply the oak seedling very quickly strikes down its juvenile root. With the onset of summer and the drying of the upper soil layers, the root is generally down to a permanently moist stratum where it can resist desiccation. Meanwhile, other slower-rooting competitors have been killed by the drought.

The production of large numbers of acorns, however, is no guarantee of adequate reproduction of the parent tree. Because of the large food supply contained in acorns, they are the target of all the fauna in the woods. The mast of white oaks in the East may be completely consumed by deer in as little as three weeks. Oregon oak suffers similarly. Other destructive agents are blue jays, rabbits, mice, squirrels and other associated rodents. As well as chewing acorns, pocket gophers and gray-diggers injure the roots of the small trees. Oak is particularly susceptible to this type of injury because the animals are customarily numerous at the forest borders, where oak is the predominating tree. Other agencies destroying acorns are frost, fungi, and acorn weevils.

Where it makes tentative extension out into the grasslands, oak is particularly vulnerable. Established grasses draw water and nutrients from the same soil layers which the oak seedling tries to penetrate, and a fairly high mortality of young trees results. Cattle stamp down or eat the tops off young. (Continuing on page 286)



B. M. Erenden
Defeat—acknowledged at last by this old oak veteran, which has finally succumbed to the encroachment of the irresistible Douglas Fir

DWARF TREE-FROGS OF NORTH AMERICA

By

HARRY EDWARD MILLER

Photographs by American Museum of Natural History

CELIA THAXTER writes in her poem, *The Hylas*:
"What are hylas, pray?
They are tree-toads, brown, and green, and gray."
She could more properly have written that they are tree-frogs, for not any of them are of the toad family.
These arboreal creatures are principally of the genus

hyla, and about two hundred varieties are scattered throughout the world. Europe knows them, Asia has them, and Australia has several kinds. But chiefly they are inhabitants of tropical America. Not all, however, can be classed as dwarfs for some attain considerable size for members of the frog multitude.

Have you ever listened of a March evening to the jangling sleigh-bell-like chorus of the "spring peepers" aroused from their winter slumber? I have found people who live all or most of their days amid country scenes but who are not acquainted with the authors of this chorus. They will attribute trills and flutings to turtles, or even snakes. Recently a man inquired of this writer, upon hearing a *hyla* calling from one of his apple trees, "What bird is that?" When I replied that it was not a bird but none other than the so-called "spring peeper," his doubt and amazement were all too evident.

North America has several of the tiny *hyla*, or tree-frogs. The smallest of these, as is true of the "spring peeper," is, at maturity, hardly large enough to cover a man's thumb nail. Compare such a dwarf with a giant bullfrog perhaps a foot and a half in length and weighing several pounds! Adult male pipers range from three quarters to an inch in length; females are an inch to an inch and a quarter. The name of *hyla* is not altogether distinctive for the "spring peeper." It has been styled the piping frog, more par-



The "Spring Peeper" — rightfully known as
Pickering's Hyla — bursting forth in song

ticularly Pickering's *hyla*, a name thought to have been suggested for Charles Pickering, early American naturalist.

The piping frogs may go into winter hibernation in the Northeast by the end of October. Yet they are not profound sleepers like some toads and frogs that remain almost lifeless throughout the winter cold. In sheltered places of woods and deeper forests, as well as other localities, "peepers" are likely to express themselves with sweetly fluted notes at almost any hour of day or night, particularly when encouraged by a mild day such as may follow some of the bitterest periods of December, January and February. On such occasions the piper will call from a tree, or possibly from a heap of debris, or from a stone fence, one of his favorite winter retreats. It is evident Pickering's *hyla* can withstand intense cold that would bowl over certain more delicate frogs.

This winter calling is more a feature of the lower, warmer area of the Northeast than the upper, colder region. In the vicinity of Boston, the earliest spring chorus bursts forth about March 26; in lower New England such choruses may be known even before mid-March. A fairly element spell, with temperature around fifty degrees, is likely to arouse the choristers, particularly when comes a misty day after a March rain.

It is understood when such a chorus is heard it rises from some pond or marshy land, perhaps from a sluggish, shallow stream where a host of the Liliputians of frogdom have assembled from their winter quarters for the mating season, their numerous eggs being consigned to water for incubation. Most eggs are deposited in April, being fastened to water plants or other objects. From six to twelve days vanish before the tadpoles appear, mites having the appearance of insignificant wriggling insects. The *hyla* chorus will, in various seasons, continue at intervals late as the third week of May, after which the adults scatter over the country. As the year lengthens, calls from the piping frog become more seldom heard; but there is no month in which this writer has failed to hear them.

Once free from the tadpole stage the young follow their parents to the land. And did not nature make provision by having such a host of toads and frogs hatch, their number would have become extinct ages ago. For the *hylas*, like members of the frog and toad world of other varieties, have to encounter a score of enemies all the way from tadpole life to maturity as amphibians. Turtles, fish, snakes, water beetles, water animals, birds, and domestic fowls, accept tadpoles or frogs as a choice delicacy. Indeed, it is amazing how any amphibians manage to escape, especially as frogs and toads usually have no manner of defense.

While they may be observed much on the ground, tree-frogs, as their name indicates, are fond of climbing up on weed or grass stalks and into bushes, shrubbery, vines, and trees. Their largest member in the Northeast is inaccurately denominated "tree-toad" by the average country resident. These climbing frogs are equipped by Mother Nature with small, rounding disks on their fingers and toes. A sticky fluid on the under side of these disks enables them to become ready climbers. They are, in fact, the squirrels of the frog tribe.

Pickering's *hyla*, like certain other of the tree-frogs, is inclined to extreme shyness. Approach a pond where thousands are sending forth their high pitched notes in March or April and all may be suddenly quiet. As you halt at the water's edge, no living frog may be seen. But wait patiently and motionless and soon small heads begin to appear from where the pipers ducked at your coming. Tiny throats swell lustily like so many miniature

balloons, and when the swelling subsides the sounds resembling bird notes are again floating over the adjacent country.

Piping frogs placed in captivity are amusing and interesting pets. They accept such a life with evident satisfaction, often not seeking their freedom when offered avenues of escape. When thus confined, they like for their homes little moss gardens. Their food consists, by choice, of small flies and worms. In captivity they are inclined to sleep throughout the daylight hours; night sees them more wakeful, but in the open they by no means are drowsy at all times under the sunlight, though they do prefer cloudy days, or that period when night approaches. Night itself meets with their greatest approval.

The range of this smallest North American frog is in Canana from New Brunswick to Manitoba; in the United States all the way southerly to South Carolina, and westerly to Ohio, Illinois and Michigan. And wherever found his colors are subject of consideration, his body color exhibiting a deep brown, a pale brown, or a true fawn shade. From these his tones may range to yellow, gray, or reddish. The fact is that the piping frog's coat, like numerous other frogs, is susceptible to change of shade under varied circumstances, the weather being among the most prominent of such conditions. Between the eyes he has a distinctive V-shape mark. A second clearly shown marking may be likened to an oblique cross. It is placed in the center of his back. On his legs there are usually found certain dusky stripings. The under part of his body is light, ordinarily with some yellow on the lower section. The throat of the male is distinguished by a splash of brown. The head of Pickering's *hyla* is distinctly pointed; the finger and toe disks are noticeable from their generous size, while small webs appear on the feet. Finally, it is well to remember that the average female has an entire costume lighter than her mate.

A beautiful tree-frog of the southern states, found as far north as Virginia, is the green tree-frog. It is partial to weed and plant stalks, though frequently it is seen seating itself on the leaves of plants. Then among the rarest of all tree-frogs is one that has been noted at Lakehurst, New Jersey, and at Anderson, South Carolina, this last town giving its name to the creature. It is one of the most strikingly dressed amphibians ever discovered; it is also one of the least known.

Colors shown by the Anderson frog are rich pea green, white, black, purplish brown, violet gray, yellow or orange, with an iris ranging from light bronze to deeply shaded bronze. This is a remarkable combination in which to clothe one small amphibian, and a combination that, in the opinion of more than one field student, places this *hyla* as the leader in beauty and loveliness among the frogs and toads of the new world.

While Anderson's *hyla* is such a mysterious rarity, the same is not true of the cricket frog, named for his notes which resemble certain utterances of the black cricket. It is a *hyla* less of a climbing nature than the "spring peeper," and his voice not so loud nor far carrying. Furthermore, his range is more southern, and on the Atlantic coast extends from lower Connecticut and New York to Florida, then to Texas, Kansas, and the Northwest. So diminutive is the cricket frog as almost to be mistaken for a cricket. Measurements of dozens of specimens have established the fact that he is hardly any larger than the average piping frog or "spring peeper." His length is from five-eighths to an inch and a quarter.

If he is less a climber than some *hyla* cousins he is perhaps a better swimmer than most of them, being aided by strongly developed webbed (Continuing on page 286)

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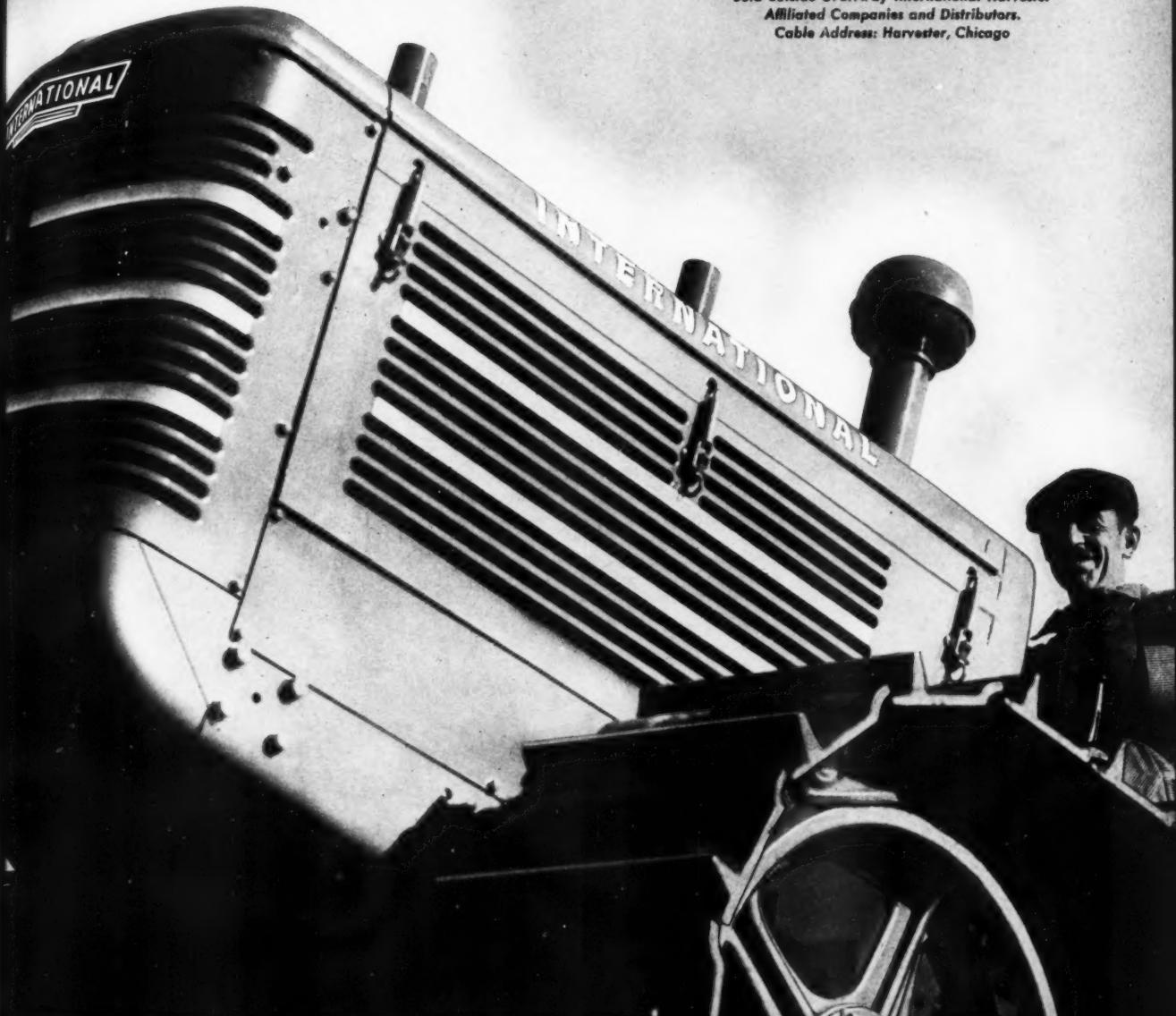
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THE KETTLE MORaine FOREST

By F. G. WILSON

ASTRIDE the kettle moraine, the master topographic feature of southeastern Wisconsin, has appeared a new state forest. It embraces not only one of the best examples of terminal moraine, but the marginal deposits of two glaciers meeting head-on. Studying geological reports, one senses the locale of a battle of giants, — the meeting of two irresistible forces moving slowly.

During the last stage of glaciation, one lobe of the continental ice sheet moved down the bed of Lake Michigan, another followed the Green Bay - Lake Winnebago valley. Lateral flow brought them into contact "with equal vigor" — "antagonizing each other" — "pushing and crowding the drift into an intricate series of ridges and depressions." There were several periods when both lobes melted back and then readvanced with the interlobate angle moving northward, like opposing football teams working the ball across the field.

Each readvance built up recessional moraines on either side, closely parallel to the interlobate moraine or branching from the main ridge at low angles. The melting of huge buried blocks of ice left the numerous potholes which gave the kettle moraine its name. In the bottoms of some of these kettles are lakes with depths of more than a hundred feet. Sinuous gravel ridges or eskers now mark the courses of streams which filled their ice walled channels with stratified gravel. Great detached kames, rising sixty to more than 150 feet above a level plain, were formed when glacial torrents dumped their burden of gravel into deep crevasses. High terraces result from outwash deposited along the ice front.

The kettle moraine contains an enormous volume of washed stratified gravel composed chiefly of the native Niagara limestone but with some material from the Lake Superior region and crystalline rock

from Canada. Nuggets of copper are occasionally found and five diamonds of gem quality ranging from six and a half to twenty-one and a quarter carats have been picked up. Thus our gem-studded kettle moraine testifies to undiscovered diamond-bearing deposits in the far north.

On both sides, along the base of the Kettle range great springs of clear cold water boil up in white bottomed pools. Because of the porous gravel deposits, this range of hills constitutes an enormous water reservoir. Despite steep slopes, there is little erosion for the moisture sinks into coarse gravelly soil.

Appropriation of funds for state forests in southeastern Wisconsin resulted

houses and youth hostels at convenient intervals. Opportunity for skiing will assure yearlong use by the people. But opportunity for recreation is not the sole objective. Gravelly abandoned fields and pastures must be reforested. Because the soil on these sites is impoverished, it may be necessary to grow a rotation of pines adapted to dry limestone soils before the native oaks, maple and basswood can be reestablished. This may call for exotics strange to the native landscape.

High school classes from neighboring cities have already set out plantations. The new forest thus serves as a forestry and nature study laboratory and will also provide demonstrations of forestry meth-

ods applicable to the farm wood lots of the region. The condition of second growth stands recently acquired calls for judicious use of the ax. Defective trees and inferior species must be removed from crowded stands to restore a semblance of the original forest.

As soon as land titles are cleared, the state will own 2,947 acres in two of the three purchase units. Land examination and appraisal are continuing with the expectation of acquiring about 2,500 acres

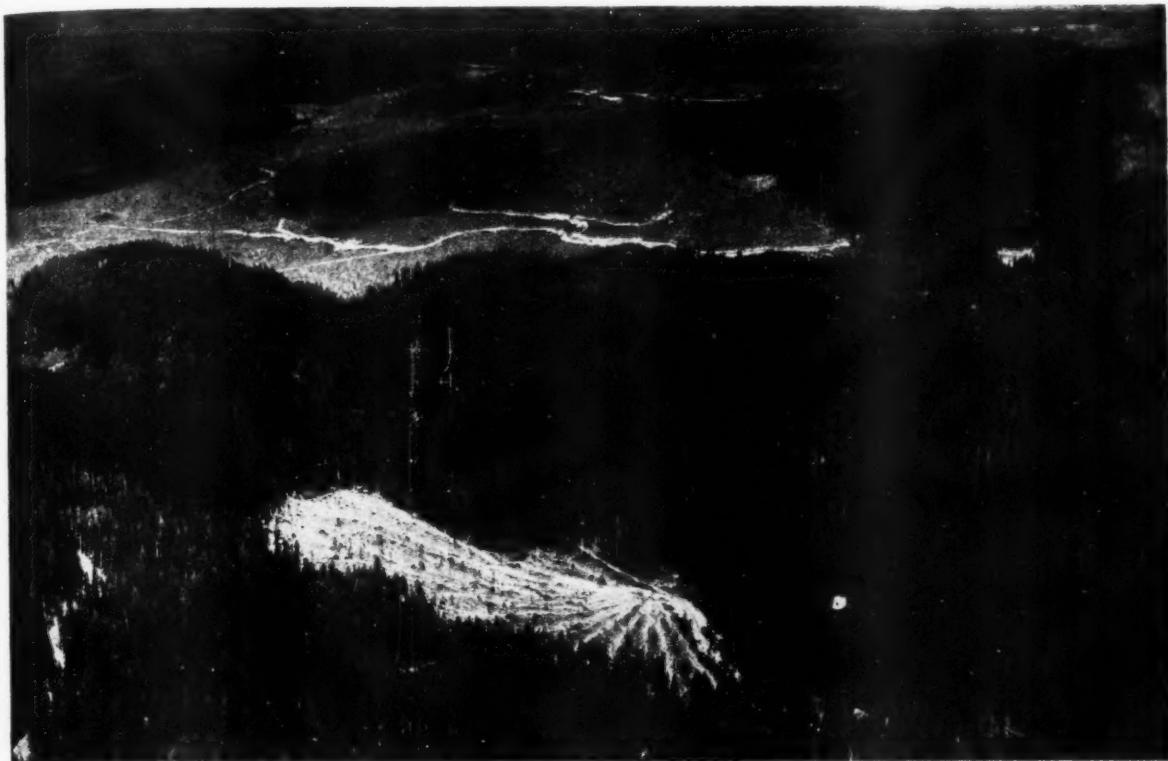


The melting of huge buried blocks of ice left numerous potholes which gave the kettle moraine its name. In the bottom of some of these are lakes a hundred feet or more in depth

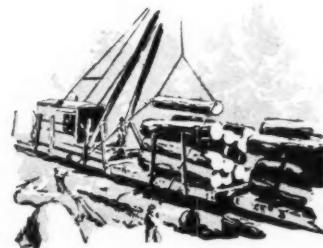
from a study of the State Planning Board. The report revealed that one-seventh of the total area of the state, containing more than half of the population, was startlingly deficient in recreation areas. Three purchase units along the moraine, together with the new Point Beach State Forest with its pine covered ridges, dunes and two and one-fourth miles of sand beach on Lake Michigan, will provide the populous southeastern counties with extensive near-by recreation areas.

The planning board report also calls for parkways leading to these forests or following stream valleys throughout the area. Eventually a trampers' trail should follow the backbone of the moraine, with shelter

annually. Hundreds of people used the original 800 acres for Sunday outings last year. This year there will be facilities for thousands. Within a decade there will be large well blocked tracts of forest providing recreation for the multitudes from the cities, but differing from the city and county parks of the region in certain fundamental aspects. Instead of being a continuing source of expense, it will eventually provide income. Instead of artificial landscape of mowed lawns, clipped shrubbery, flower beds and scattered shade trees, it will provide city dwellers with natural beauty of hill and vale, of lake and stream, of wild flowers native to the woods and swamps and the solitude of forest trails.



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90% of the virgin timber standing on land owned by Weyerhaeuser Timber Company has reached or passed maturity. The orderly economic harvesting of this mature timber calls for planning by foresters, loggers, and engineers. After a careful inventory to determine the quantity and quality of timber, topographic maps are made and a complete transportation system laid out. As we

harvest, strips of green timber are left to insure natural regeneration.

Wise harvesting of Douglas Fir forests requires the development of adequate research in utilization, silviculture, logging, manufacturing, trade promotion, and marketing. The development of the pulp industry has extended the utilization of hemlock and white fir. The development of plywood, wood briquets, end-matched lumber, lumber patching and improvements in milling have promoted the wider use of the raw materials of the forest. Our research is constantly opening up new avenues of utilization.

Our job consists of harvesting a mature forest crop in such a way as to establish a succession of orderly, cultivated, controlled stands. The men of Weyerhaeuser Timber Company are engaged in converting a wilderness into a managed Tree Farm.



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Preservation of Wilderness for Recreation

Establishment of State and National Forests and Parks

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Resources Board Seeks Hydrologic Study

A program of hydrologic studies designed to improve present day hydrologic knowledge and provide a sound basis for the development and utilization of the country's water resources is recommended by the Water Resources Committee of the National Resources Planning Board in a report transmitted to President Roosevelt on April 25.

The report outlines investigations covering such items as the movement of intense storms, infiltration of rainfall, relation between snow cover, water yield and stream flow, and the movement of ground water, all of these representing the hydrologic cycle about which much additional information is needed. The report urges that the long-range studies, by federal and state agencies, be undertaken in full cooperation with educational and other interested institutions. Such a program, the report says, would involve "expenditures insignificant in comparison with the savings which would be effected in the cost of structures."

Insufficient hydrologic data and the lack of accurate interpretations of these data, rather than lack of engineering skills, has cost the nation millions in the past, according to members of the Water Resources Committee, who point out that many important dams have failed and other disastrous losses have been suffered on this account.

Members of the committee point out that these losses concern not only water resources but that many indirect investments are involved such as urban real estate and farm lands exposed to floods, cities relying on a plentiful supply of unpolluted water and industries which cannot plot their future without knowing what water conditions exist.

"Research alone provides the techniques which are essential to the solution of flood control, irrigation, drought, soil erosion and other problems encountered in the development of a water policy which is both hydrologic and economically sound," says the report.

"Present information on the significance and interrelation of different phases of the hydrologic cycle contains much that is in need of further verification and there is a serious lack of understanding of the significance of many phenomena.

"Improvement of this situation can best be effectuated by a competently organized and thoroughly coordinated long-range research program given continuity by adequate appropriations."

Establishment of a coordinated group or clearing house is recommended with the functions of issuing bulletins on research either contemplated or under way.

A previous report on deficiencies in basic hydrologic data presented a comprehensive program, from a national viewpoint, for the adequate collection and publication of fundamental data relating to precipitation, stream flow, and other elements of the hydrologic cycle.

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BUT—did you ever stop to realize that these huge reclamation jobs could *never* have been done *without* dynamite?

Dynamite is truly the builder of America. It mines the ore for all machinery—from tractors, steam shovels and locomotives to electrical power plants, irrigation pipes and your own automobile. It quarries the cement for dams, bridges, canals, tunnels.

On every hand, all over the country, you'll see the constructive

influence of dynamite!

Du Pont has long been keenly interested in American conservation and reclamation. And one of Du Pont's greatest contributions has been the development of explosives for every blasting and building purpose—explosives that have *proved* their ability to do a better job at lower cost.

If you have a blasting problem, Du Pont will be glad to offer you the benefits derived from the experience of manufacturing explosives for 137 years. Just write E. I. du Pont de Nemours & Company, Wilmington, Delaware. (Inc.), Explosives Department,

● A scenic highway, huge dam, or canal starts right here! Dynamite quarries the millions of tons of rock for the concrete used every year.



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PUT A NEW STAMP ON FOREST FIRES



NOW AVAILABLE The American Forestry Association's new 1940 Poster Stamp.

Printed in sharp colors with a striking design and the slogan — "KEEP YOUR COUNTRY GROWING — NOT BURNING. PREVENT FOREST FIRES" — the stamps are arresting reminders to be careful with fire while in the woods and have been endorsed by the National Poster Stamp Society.

THIS SUMMER millions of people will be motor-ing, hiking, camping or otherwise vacationing in the forests of our country. They must be reached with constant reminders to "Prevent Forest Fires." The poster stamp has proved the quickest, readiest and most effective means of reaching large numbers of people. Stamps provide an easy and convenient way for you to do your bit in helping to save our forests, wildlife and soil from the ravages of forest fires.

USE STAMPS on your letters, postcards, packages, bills, checks—on every piece of mail that leaves your hand or office. Order your supply today and help keep forest fires away.

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Please send me sheets (\$1 per sheet of 100 stamps) of the 1940 Forest Fire Prevention Stamps. I enclose \$

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SCIENCE AND EQUIPMENT

BLACK LEAF-40

About ninety-nine per cent of the insect pests which you find on the leaves of plants or bushes in the garden are found hidden away on the under-side. Nature has taught them that the upper side of the leaf is no place for an insect that wishes to remain healthy.

Bearing this in mind when we go into the garden to spray, we should "bend our backs" and get down under the leaves and branches if we are to do a good job. The spray must be applied to the insect. Many types of insects, such as aphids, leaf-hoppers, leaf-miners, most thrips and young sucking bugs are handled by a contact spray such as "Black Leaf-40."

BURKEY ELECTRIC FISH SCREEN

Heretofore the greatest problem in fish conservation has been to hold fish within a predetermined area—yet to allow passage of water and debris. Any screen or grid with small enough openings to prevent the passing of fish would also accumulate debris and unless this accumulation is constantly removed the screen becomes a dam endangering fish life and interfering with normal water levels.

The invention of the Burkey electric fish screen, which creates a zone of electrified water, should do much to revolutionize the fish conservation programs. The electrified water is used as an effective barrier to fish and other aquatic life and this zone of water is graduated in strength so that fish upon entering the forbidden area receive harmless electric shocks—increasing in intensity as they proceed into the zone. This new barrier warns fish to go no farther and to immediately reverse their directional course of travel into neutral waters.

The Burkey screen consists of three simple durable parts: (1) The electronic impulse generator, housed in a water-proof cabinet. (2) The "live" electrodes, suspended to swing freely from an overhead support yet clearing the bottom of the stream to promote the passage of debris. (3) A suitable "ground" which completes the circuit through the water thereby creating the electrified zone.

This new fish screen promises to open up a new era in the conservation of one of our great natural resources, and the manufacturers have emphasized the fact that this particular fish screen demonstrates the application of scientific principles to solve a practical problem, by controlling all species and sizes of fish without temporary or permanent injury.

FORESTRY IN CONGRESS

Two days before Hitler released his war-thirsty hordes into Belgium and Holland, the House Committee on Agriculture sent to the "Committee of the Whole House on the state of the Union," with a recommendation that "it do pass," a bill whose preamble reads as follows:

"WHEREAS the Continental Congress of 1782 adopted the bald eagle as the national symbol; and WHEREAS the bald eagle thus became the symbolic representation of a new nation under a new government in a new world; and WHEREAS by that Act of Congress and by tradition and custom during the life of this Nation, the bald eagle is no longer a mere bird of biological interest but a symbol of the American ideals of freedom; and WHEREAS the bald eagle is now threatened with extinction—"

Hands Off the American Eagle

Therefore, hands off the American eagle! This bill is cited as appropriately typifying the crescendo of Congress as this issue goes to press. War and the needs of speedy preparations against war have diverted the flow of normal legislation into eddies of minor concern. Only major or emergency bills are moving and these, in most cases, slowly.

Many of the conservation measures appear sidetracked for this session of Congress. Since the last issue of AMERICAN FORESTS only one measure of conservation bearing—and this indirectly—has reached the President's desk. This is H. J. Res. 519, suspending the Merchant Marine Act of 1936 during the present European war so as to release for inter-coastal trade some 109 ships of the government's Great War maritime fleet which have been whitening in a watery bone-yard of the lower Mississippi, locked there by a section of the Maritime Act which bars from use government-owned ships more than twenty years old. Release of these old ships represents emergency action on the part of Congress to meet disruption of intercoastal trade, particularly on the West Coast, where forest and other industry has been hard hit by the diversion of shipping bottoms to foreign trade. (See Editor's Log.)

No important conservation bills have cleared Congress since last month's report. The regular appropriation bill for making available funds for the Interior Department, however, which includes a group of conservation agencies, was passed by the Senate on May 2 with amendments and will probably be on the President's desk within a few days. The conference report on the Agricultural Appropriation bill is still being debated in the House, having been submitted to that body on April 29.

Among the relatively small number of bills which have been reported out of

committees are the following: The bill already mentioned, making it a crime against the United States to hunt, kill, or possess the bald eagle "or any part, nest, or egg thereof," and imposing a fine of not more than five hundred dollars or imprisonment not to exceed six months, or both.

National Park Fees

H. R. 9535, providing that twenty-five per cent of the receipts of the fees charged by the national parks shall be distributed to the states in which the parks are located. This bill was favorably reported by the House Committee on Public Lands on May 10.

Senate Resolution 241, calling for an investigation of the administration of the Taylor Grazing Act by the Department of the Interior. The resolution was reported April 10, amended to authorize and directed the Senate Committee on Public Lands and Surveys to make "a full and complete investigation of the purchase, withdrawal, and allocation of lands and the administration and use thereof by or on behalf of the federal government or any agency thereof."

Senator Ashurst's resolution, prompted



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to judge those features intelligently and select a glass most suitable for a particular purpose. 32-page catalog, free on request, tells how to make comparisons, describes Bausch & Lomb Field Glass and Binocular models, \$16 to \$132. Bausch & Lomb, 148 Lomb Pk., Rochester, N.Y. Above, Bausch & Lomb 8 power, 30 mm Zephyr-Light Binocular, 16½ ounces, \$90.

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BUYS AND SELLS

Western Timber Lands

by the Interior Department's recent imposition of charges for the filming of motion or sound pictures in the national parks and calling for a general investigation of the taking of motion and sound pictures on federal lands was reported to the Senate by the Committee on Public Lands on May 9, without amendment.

Senator McNary's bill, S. 229, to authorize the withdrawal of national forest lands for the protection of water supplies for municipalities is on the House calendar, having been reported with an amendment by the Committee on Agriculture April 17.

National Flood Control Policy

To continue the national flood control policy and program initiated by the Act of June 22, 1936, the current flood control bill, H. R. 9640, introduced May 2 by Representative Whittington, was reported out by the Committee on Flood Control on May 7. The bill carries an additional spending authorization of \$197,000,000, of which \$6,000,000 would be available in equal amounts to the Departments of War and Agriculture for up-stream flood control. If passed, total authorizations for flood control throughout the United States—exclusive of the lower Mississippi River—authorized since 1936 will amount to almost \$900,000,000.

Still jammed in conference committee is the Barkley Water Pollution Control bill, S. 685, carrying the Mundt amendment with its prohibition against new sources of water pollution. No meeting of the conferees is scheduled at this writing. And cooling their heels in committees of either the House or the Senate are Representative Coffee's peeler log bill, to restrict the exportation of Douglas fir peeler logs twenty-eight inches and over in top diameter and Port Orford cedar logs; Senator Johnson's bill, S. 3532, to legalize boards of stockmen in connection with the graz-

ing administration of the national forests; and Senator McNary's S. 231 and Representative Doxey's companion bill H. R. 299, to make possible the preservation of forests and natural beauty along federal aid highways.

New Bills

Among new bills introduced, none of which it is believed will successfully run the gauntlet of this session of Congress, is one of special interest. It is S. 3805, introduced in the Senate on April 17 by Senator Josh Lee, of Oklahoma. The bill, apparently, is designed to authorize soil conservation and flood control work at the headwaters of streams not authorized by the Flood Control Act of June 22, 1936. That act restricted up-stream flood control to those streams and rivers upon which the War Department is authorized to do down-stream flood control work. Senator Lee's bill would extend the authority to certain named streams—including the Ouachita River in Oklahoma—upon which War Department projects have not been approved. It would further make possible diversion of the \$4,000,000 made available by the Act of 1936 for up-stream flood control work, to streams not contemplated by that act. And it would appropriate an additional sum of \$10,000,000 for up-stream work.

As widely heralded through the press, President Roosevelt won through on his Fourth Reorganization when the Senate voted down on May 14 the resolution of disapproval previously passed by the House. The Senate's action clears the way for the bureau and agency shifts specified by the order, among which are transfer to the Department of Commerce along with the Civil Aeronautics Authority—spearhead of the attack on the order—of the Weather Bureau now in the Department of Agriculture and transfer from the same department to the Department of the Interior of the work of the Soil Conservation Service relating to public lands, now under jurisdiction of the Interior Department.

DUTCH ELM DISEASE

The outlook for funds with which to carry on the work of eradicating and controlling the Dutch elm disease remains uncertain. While a reduced appropriation of \$400,000 for the work is carried in the Agricultural Appropriation bill and the item has been agreed to by the conferees, the prospect for WPA funds with which to supplement the regular appropriation is not encouraging. The pending relief bill carries only \$20,000,000 for allocation to the departments for federal projects. This is a radical reduction of the funds which have been currently available for such work and means that many going projects may have to get along without WPA allocations or with greatly reduced help from that source. In the event relief funds or allocations of moneys from other sources are not provided for continued control of the Dutch elm disease, the work will be left in a critical condition and one which may not only nullify funds already spent in control work but may permit the disease to get wholly out of hand.



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Here, high in the scenic Alleghenies (2200-ft. alt.), cares vanish, business-tense nerves relax, winter-weary bodies enjoy Crestmont's restful surroundings, sunshine, tonic air, superb meals!

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Seven championship tennis courts, with instructor
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Children's playground—a trained kindergartner in charge.
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FEDERAL NEWS AND REVIEWS

Completion of the Civilian Conservation Corps' 1940 tree planting program will bring the aggregate number of seedlings planted by the CCC for reforestation purposes above the 2,000,000,000 mark, James J. McEntee, director of the Corps, stated May 15. Aggregate plantings for all purposes, including erosion control plantings to fix the soil, trees planted in national and state parks, on Indian reservations, on the public domain and on wildlife refuges, will exceed 2,400,000,000 by December 31, it was stated.

Of the 1,800,000,000 seedlings that have been planted to date for reforestation purposes, approximately 750,000,000 were in the Lake States. In New York 171,000,000 were planted; in Louisiana 152,000,000; in Mississippi 111,000,000.

Federal Aid Law

During the first twenty-one months of operations, 196 Federal Aid in Wildlife Restoration projects in forty-three states were approved by the Bureau of Biological Survey.

Under the Federal Aid program, participating states sponsor wildlife restoration projects which include research into problems of wildlife management, restoration of areas of land or water to provide additional benefits for all forms of wildlife, and acquisition of lands for wildlife management and breeding areas. The federal government pays seventy-five per cent of the cost, and the state twenty-five per cent.

Typical examples of Federal Aid projects include studies of wild turkeys in Arizona, purchases of winter range for deer and elk in Colorado, transplantings of beavers in Idaho, restocking of pheasants in Nebraska, restoration of bobwhite quail in Oklahoma, and studies on factors determining the abundance of Rocky Mountain sheep in Wyoming.

Of the 196 Federal Aid projects already under way, seventy-two are research projects to which about 100 wildlife technicians devote full time; seventy-six are development projects employing thirty professional, technical, or specially trained supervisors; and forty-eight land acquisition projects. Cooperating with the Biological Survey and state fish and game departments in formulating and directing Federal Aid work are regular state employees, conservation workers in other federal agencies, and staff members of universities and colleges.

Southern Timber Stands Understocked

Forest stands in the South are only one-half to one-fourth stocked, according to a report of the Forest Service. Compilation of data based on field surveys in 1932-1936 indicates that frequent fires

have resulted in reduced and poorly growing stands throughout the commercial timber belt of the South.

Fifty-nine per cent of this area was classified as productive forest land and in each state more than fifty per cent of the area surveyed was found to be in productive land. Old growth stands comprised fifteen per cent of the productive forest area. Second growth stands, including reproduction, were found on seventy-seven per cent, and clear-cut forest land on eight per cent of the productive area.

The survey found nearly 1,500,000,000 cords of sound material in the forests of the South, although comparison of the annual growth with the annual drain in these states indicated that more sawtimber is being drained for industrial and domestic use than is being grown. For the area as a whole, this deficit totalled more than 1,000,000,000 board feet during 1936.

With adequate fire protection and good forest management, the growing stock in many localities of the South could be doubled in two or three decades, the Forest Service states.

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NEW BOOKS and OTHER PUBLICATIONS

A list of Selected Books
on Forestry and related
fields of Conservation is
available to members of
The American Forestry
Association on request.

KINGDOM OF THE TREES, by Erle Kauffman, illustrated by Calvin Fader. Published by Reilly & Lee Company, Chicago. 122 pages, with a table for tree identification added. Price \$2.00.

Through intimate, friendly talks with the "Old Forester," Ben and Betty are introduced to a new kingdom and meet its people — the trees — clothed in their true characters as artists and architects, farmers and builders, doctors, kings and soldiers. Simply and directly, the Old Forester pictures the trees, functioning as individuals in their marvellous but natural ways, for the benefit of mankind.

He tells about the various kinds of trees, how they can be identified, how they are nourished; what causes the leaves to fall in the autumn; what kinds of wood are used for keels of boats, for musical instruments, for oars, for airplanes. But these are only a few of the things he tells in this fascinating story.

Mr. Kauffman, who is associate editor of AMERICAN FORESTS, has given meaning to trees by showing them in their relation to human activities and fitting them directly into the life patterns of his readers. The things a youngster—or for that matter, an adult—will want to know about trees are here. The history, botany and economics of trees are set forth so clearly and divertingly that they will never be forgotten. Dedicated to youngsters and prepared especially for them, this book should and will find its way into every American home.

ROCKY MOUNTAIN TREES, by Richard J. Preston. Published by the Collegiate Press, Inc., Iowa State College, Ames, Iowa. 285 pages, illus. with a glossary and appendix added. Price \$2.00.

This handbook of native species carries clear, concise, complete descriptions and illustrations of all trees known to grow in the extensive and beautiful forested areas of the Rocky Mountain region, — including Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Western Tex-

as and Wyoming. Trained foresters and botanists will welcome this addition to tree literature, and the author, who is associate professor of forestry at Colorado State College, has included in his work a glossary which will enable those unfamiliar with technical terms employed to interpret descriptions accurately and understandingly.

THE HOME BOOK OF TREES AND SHRUBS, by J. J. Levison. Published by Simon and Schuster, New York, N. Y. 424 pages. Illustrated. Price \$5.00.

Owners of small and large estates who delight in arranging their home grounds and expressing their own individual ideas in formal or informal landscaping may do so with little risk of failure under the expert guidance of Mr. Levison, as presented in "The Home Book of Trees and Shrubs."

The author, an outstanding American arboriculturist and landscape forester, has covered all phases of horticultural problems and gives the benefit of his long and varied experience in the growing and care of arboreal material. He discusses plans for home grounds, the selection, planting and care of trees and shrubs, methods of proper pruning and repair, and control of insects and diseases.

Additional chapters are devoted to tree and shrub identification, the care of lawns, and the planting of flower borders.

The book is nontechnical, and the suggestions and advice offered are easily grasped by the layman.

HANDBOOK ON SHOTGUN SHOOTING, published by the Sporting Arms and Ammunition Manufacturers' Institute, 103 Park Avenue, New York City. 100 pages, illustrated. Distributed free — send 15 cents to cover mailing.

This little book does much to simplify the shooter's problem by expounding what is meant by "engineered shooting" — a new idea in the art of shotgun marksmanship. By angles and diagrams, it demonstrates precisely what occurs in the flight of a moving target and explains in simple terms the action a gun must take for each kind of shot.

TROUT, by Ray Bergman. Published by The Penn Publishing Company, Philadelphia. 451 pages. Illustrated. Price \$5.00.

This splendid book covers the method and tackle needed for brown trout, rainbow trout, steelheads, brook trout and cutthroats. There is also information on land-locked and Atlantic salmon, besides an interesting chapter on Montana grayling. Informative, philosophic, entertaining, breathing the atmosphere of the forests, lakes, mountains and streams, every angler will cherish this book and look upon it as a true friend.

THE WATCHER AT THE NEST, by Margaret Morse Nice. Published by The Macmillan Company, New York City. 159 pages. Illustrated. Price \$2.00.

A charming story of two song sparrows is told here by the author, who fol-

lowed closely the lives of her two neighbors, Uno and 4M, over a period of several years. From child to grandchild, Mrs. Nice has jotted down her keen observations of the trials and tribulations of these birds who dwelt in her garden.

Also, the reader is given an insight into the characters of other species of birds in this interesting study.

A GUIDE TO FORESTRY ACTIVITIES IN NORTH CAROLINA, SOUTH CAROLINA, AND TENNESSEE, by William Maughan. Published by the Appalachian Section of American Foresters, Box 252, Asheville, North Carolina. 287 pages. Price \$1.50 paper bound; \$2.25 art vellum cloth cover.

The work of nine federal agencies, the state foresters farm forestry extension agencies, together with educational activities in six universities and colleges, and the forestry work of a number of corporations and individuals are briefly described for the States of North Carolina, South Carolina, and Tennessee in the Guide to Forestry Activities as edited by William Maughan. A most helpful contribution of the Appalachian Section of the Society of American Foresters which proves that real forestry is being accomplished in this great southeastern region.

THE WORLD OF INSECTS, by Carl D. Dunigan and Gayle Pickwell. Published by the McGraw-Hill Book Company, New York. 409 pages. Illus. Price \$3.50. Comparatively brief and non-technical,

this book reviews the many fields upon which the insect impinges, discussing such topics as insect structures, how insects grow up, insect foods and feeding habits, insect food-getting devices, how insects reproduce themselves, how insects get air, how insects move, how insects are protected, insect voices, insect fitness, insect orders, social life among the insects, the value of insects, injurious insects and their control, where to look for insects, and how to collect and preserve them. One of the outstanding features of this book is the collection of 194 unusual illustrations.

MOUNTAINS IN FLOWER, by Volkmar Vareschi. Published by the Macmillan Company. 159 pages. Illustrated with seventy-two plates by Ernst Krause. Price \$3.00.

Dr. Vareschi and Mr. Krause have contributed here a unique literary and pictorial legacy which brings to the reader the spiritual as well as something of the material loveliness of the European Alps and the gorgeous alpine flowers which grace the landscape.

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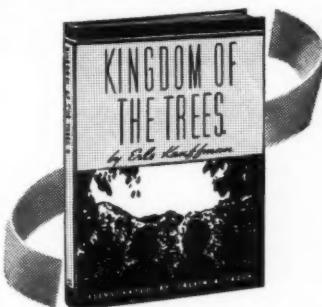


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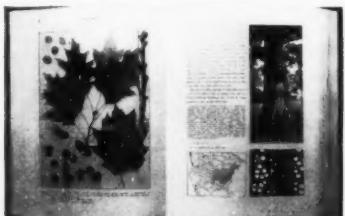
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Reports of waterfowl starving were unusually numerous during the past severe winter, but as in previous years investigations revealed that in practically every case something besides lack of food was responsible for any serious condition of the birds, the Bureau of Biological Survey reported on April 30.

Many of the recent starvation reports were said by the federal officials to have been overpublicized in connection with promotional campaigns and efforts to oppose the continuation of the prohibition against using feed as a bait to lure waterfowl to gunners.

Citing a study made in the Illinois River Valley as an example of its recent investigations, the Biological Survey pointed out that twenty out of forty-one specimens of supposedly starved birds were found to have died of lead poisoning. The remaining twenty-one birds had died of other causes, but many of them also showed characteristic signs of lead poisoning. Examinations showed that eight of the twenty-one birds were heavily infested with internal parasites, and three were suffering from gunshot wounds at the time of their deaths. Of the remaining ten, seven had a considerable amount of corn, small grain, and other food in their gizzards, thus eliminating starvation as a cause of death.

A survey investigation made on Round Lake near Ruthven, Iowa, last winter

showed that about three-fourths of 123 dead mallards found on the area had food in their crops. About a fifth of the gizzards were bulging with food, which could not be digested because the muscles were paralyzed as a result of lead poisoning. All but one of the 123 birds contained shot.

One number five lead shot, it was explained, will make a duck sick and often kill it, though usually more are required to cause death. Though a duck may eat many lead pellets, it will seldom recover if it has taken more than four.

The Illinois and Iowa studies, Biological Survey officials said, have supported similar findings of other wildlife pathologists in different parts of the country where reports of starving ducks have been common in many winters. These studies indicate that lead poisoning is the cause of death of about fifty per cent of the ducks picked up in sections where starvation was originally suspected. Lead pellets by paralyzing the digestive tract affect old and young, healthy and unhealthy ducks alike. The pellets remain in the marshes and are taken by the birds in their search for food.

Wildlife technicians, it was pointed out, are trying to perfect a shot which will disintegrate after it comes in contact with water, and it is hoped that ammunition manufacturers will soon find it practicable to use such an alloy.

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An intimate glimpse into the First President's life with trees—records that he wrote in his diary concerning his love for them. Tells also of the famous trees associated with him, particularly the trees of Washington, D. C.

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New Threats to Park Planning

Subtle forces are at work today in park programs—state and national—Newton B. Drury, Secretary of the Save-the-Redwoods League and an executive of the California State Park Commission, declared in an address in Washington on May 9. Mr. Drury was one of the speakers at a dinner commemorating the twenty-first anniversary of the National Parks Association. The subject of his address was "Preserving the Native Landscape in California and the Nation."

After reviewing park problems in California and outlining how the state is endeavoring to meet them, Mr. Drury said that under present conditions park administrators in planning and developing the highest use of public areas "sometimes have to be saved from themselves."

"In the performance of this governmental function," he warned, "there are trends of thought and attitudes of mind that need constantly to be resisted and the first step in their resistance is to recognize and name them."

"There is bureaucracy," he continued, "making of the administrative turmoil an end in itself instead of a means, ever striving to magnify its importance by greater activity, good or bad; obsessed with megalomania."

"There is showmanship, revelling in attention and plaudits, discriminating and otherwise; intent on building up an increasing 'public' by being all things to all men; not content with a simple clean-cut task well done."

"There is a sort of technical virtuosity. Armed with ample funds, great groups of well trained earnest men—road builders, fire preventionists, landscapers, dam constructors, soil erosionists—all secure in mastery of their technique and eager to display it, mobilize upon the unsuspecting landscape."

"There is finally a state of mind partly induced by the embattled recreationists, which for want of a better term we might call a democraacy complex. The argument runs something like this: 'These are public lands; the people own them; therefore, they should be used in all ways that give people enjoyment.' **** The same

STATE APPOINTMENTS

Raymond J. Kenney, director of the Massachusetts Division of Parks, has been named Commissioner of Conservation for that state by Governor Saltonstall. Mr. Kennedy has been in state conservation work for twenty-two years, serving part of the time with the State Division of Fish and Game.

In Oregon, the State Board of Forestry has appointed Nelson S. Rogers as state forester, succeeding Carl Davis, Coos Bay logging operator, who has served as acting state forester since the resignation of J. W. Ferguson in January. For the past five years Mr. Rogers has been employed by the State Tax Commission on timber valuation work. Prior to that he was assistant state forester.

claim might be made for a corner saloon. It is not necessary to labor the point, but obviously there is here a line of thought that represents one of two things—either confusion as to true functions, or satisfaction with something less than the best that can be done for the people with their properties. Of course the people own the parks; of course they have a right to use them. But they are a heritage and no one generation has a right to use them up."

In California, Mr. Drury stated, the State Park Commission is trying to be alert to wrong trends and to perversion of the governmental mechanism by appraising the highest values of public park properties and planning to use it so as to protect those values. He declared that in assuming responsibility for the protection of some of its outstanding scenic values California "has been guided in its policy by principles and ideals in harmony with those contended for, with respect to national parks, by the National Parks Association."

Other speakers at the Association's dinner were Dr. Wallace W. Atwood, president of Clark University, who spoke on "Protection of Nature in the Americas," and Dr. John C. Merriam, president emeritus of Carnegie Institution, whose subject was "The Human Values of Parks." William P. Wharton, president of the National Parks Association, presided, and Dr. Henry Baldwin Ward acted as toastmaster. Among guests present were John V. Hansen, vice-president, Amateur Cinema League; Dr. D. Alfredo Sordelli, director Bacteriological Institute of Argentina; Dr. Pedro C. Sanchez, director, Pan American Institute of Geography and History, of Mexico; and Robert Woods Bliss, president of the American Federation of Arts.

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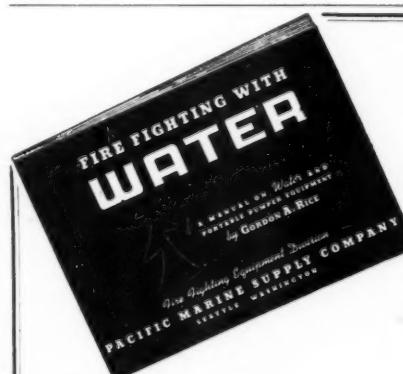
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Tar spot of maple — one of the most spectacular of the leaf troubles, causing jet-black lesions with pale green margins in early summer

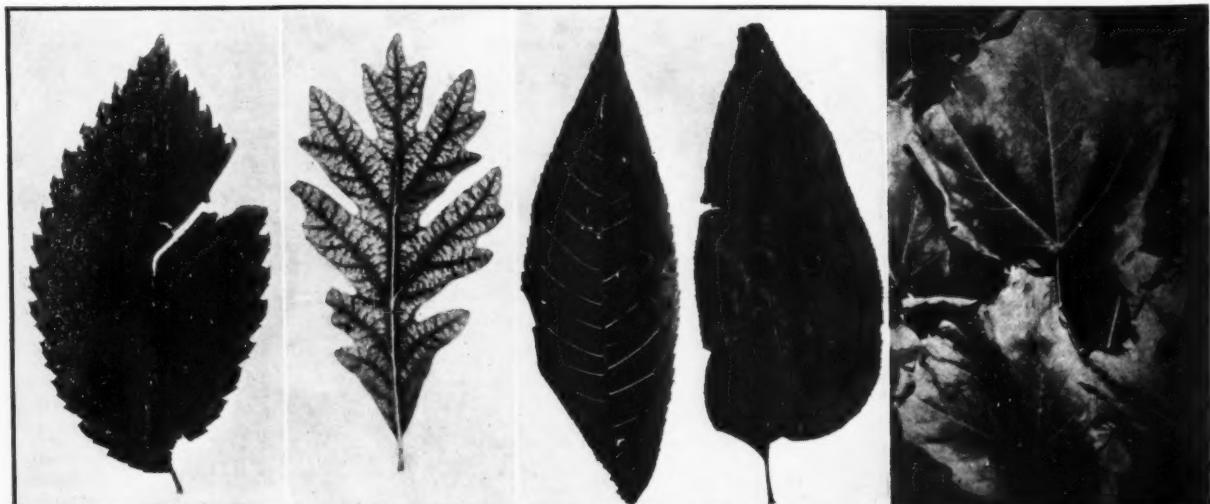
"WHAT CAN we do to save our trees? The edges of many oak leaves are notched — the beech leaves wrinkle, curl up, become yellow and die — the elm leaves show ugly spots and the virile leaves of our horsechestnuts are withered and full of holes. And our lovely maples! — some have shriveled leaves and some look as if burnt, while others as though some busy, evil spirit had tarred their beauty with pitch! Our place is large and our trees our chief joy — what has struck them and what will save them?" Thus might be written a composite letter, combining the wails of tree owners whose shade trees are the victims of the leaf diseases.

But the situation is not hopeless for most of the difficulties yield to treatment.

It is no wonder owners are alarmed, for these diseases usually evidence themselves early in summer, destroying the beauty and often the shade value of trees temporarily. Defoliated trees must not be considered dead, for in a normal season they will again put out a dense, leafy cover. The actual injury to the tree from this form of disease is reduction in growth and the stored foods in the tree, because of the decreased green leaf area which is, of course, the food manufacturing portion of the tree.

Symptoms of leaf diseases are usually brown or black dead areas on the leaf, discoloration from the normal green color to yellow or brown, reduced size of the leaf, or partial or complete loss of the

leaves of the tree. These leaf diseases are the result of various parasitic or non-parasitic causes. The parasites affecting leaves are mostly the microscopic plants called fungi, which penetrate the leaf tissue and use up food material for their growth, finally killing the tissues they have invaded. They reproduce themselves by means of spores—minute, seed-like bodies spread principally by the wind and the splashing of rain, though some kinds are carried by insects and birds. They must have moisture — either rain or dew — in order to germinate and carry on their career of infection and destruction of other leaves. For this reason, parasitic leaf diseases are more prevalent in wet seasons and often disappear during seasons of drought. Some



Elm leaf spot — a parasitic disease characterized by tiny black areas, edged with white

In chlorosis of white oak, the dead areas are found principally around the edges

Walnut anthracnose causes abundant brown, circular lesions, which produce the spores

Leaf-scorch of hard maple — a non-parasitic disease usually due to drought injury

YOUR SHADE TREES

LEAF DISEASES

By FORREST C. STRONG

spread more slowly than others and the evil result of their work in stripping the trees of leaves is not evident until later in the season. There are, as a rule, several parasitic leaf diseases for each kind of tree, but only one or two will be prevalent or of serious import. Limited space precludes the discussion of more than a few of the most serious and better known types of leaf disease, but even this limited treatment may serve to allay the fears of tree owners who have contemplated nothing but destruction and removal as the answer to their difficulties.

The common elm leaf spot is characterized by tiny black areas which at first have narrow, white margins. Upon close examination, these spots appear to be raised black crusts. They increase in number as the summer advances, and if the season is favorably wet, may cause severe defoliation during August.

Anthracnose of sycamore and white oak is very destructive in that it kills many sycamore twigs. Irregular brown lesions which center along the veins are produced



Horse chestnut leaves injured by leaf-blotch—a common disease usually due to water deficiency

on sycamore leaves. Sometimes large portions or whole leaves are killed outright by these infections. The dead areas on oak are to be found principally around the edges of the leaves extending inward along the veins. White oak twigs are seldom injured to an appreciable extent. This disease usually attacks with greatest severity during May and June and is sometimes mistaken for frost injury.

Maple is affected by an anthracnose very similar in appearance to that found on the sycamore and white oak. It causes great injury early in the summer. The brown, diseased spots are found more often between the veins than on them.

The tar spot of maple is one of the most spectacular leaf troubles although it seldom causes severe injury except in nurseries of young trees where all leaf diseases are more injurious than on larger trees. This disease is well named because the lesions are jet black with a pale green margin in early summer, and have a raised cushion-like appearance as if a bit of tar had been warmed and flattened down on the leaf. The affected areas range in size from an eighth to three quarters of an inch across. Tar spot is usually more prevalent late in summer. It is found on all maples, but in the United States is most serious on red and silver maples.

Walnut is frequently affected by an anthracnose. The symptoms are brown, circular lesions which become abundant late in the summer and commonly cause leaf fall

some two weeks earlier than the normal, except on individually resistant trees.

Leaf blotch is a common disease of the horse chestnut and is almost always present on this tree except in very dry seasons when it is replaced by leaf scorch, a water deficiency trouble. Large, angular, brown areas develop over the leaf surface. Close examination will reveal a deeper shade of brown in the areas first affected, and on the darker areas, many tiny dots are visible. These are the fruiting structures which produce the spores.

Tiny brown spots often appear on the leaves of many hawthorn trees. They rapidly increase in number during wet seasons and in the case of Paul's Scarlet Thorn, they may cause complete defoliation (even in the drier seasons this may also occur). This disease is not to be confused with the red cedar-hawthorn rust disease which is characterized by larger yellow, lesions which have tiny horns arising from the lower surface.

Catalpa is often attacked by a fungus which causes circular, brown areas ranging in size from one-sixteenth to one-quarter inch in diameter. White poplar is subject to a leaf disease distinguished by brown, angular spots.

White poplar is subject to a leaf disease distinguished by brown, angular spots.

The powdery mildews are a group of parasites which attack the leaves of many plants including trees and shrubs. A white, felt-like growth develops on the leaf surface and a mass of spores

is soon produced, giving the powdery appearance from which the name arises. Although superficial, these fungi do penetrate the leaves to obtain their food and thus cause considerable injury.

Sooty molds must be mentioned although they are not parasites, but are to be found on leaves where plant lice or other sucking insects have been working. Little harm is done to the leaves except the disfiguring appearance of the dark sooty covering.

Conifers are also affected by several parasitic leaf diseases which are known as blights and needle cast. Some of the parasites attack old needles, and some attack only new growth. Since both old and new needles are seldom affected by the same fungus, complete defoliation does not occur any year. However, the partial defoliation decreases food production, and consequently growth.

The control of most parasitic leaf diseases can be accomplished by either or both of two methods. The easiest way consists of the raking up and burning of fallen leaves in order to reduce the amount of infectious material. Most leaf parasites

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live over winter in the fallen leaves and in the spring, produce spores there which infect the young leaves, thus starting the cycle of disease anew.

In addition, a spray program may be necessary when particular leaf diseases have been severe year after year. This consists arbitrarily of three applications of a fungicidal spray such as Bordeaux mixture. Bordeaux mixture is made by dissolving four pounds of copper sulphate (blue stone) in twenty-five gallons of water, and six pounds of hydrated lime in another twenty-five gallons of water. These two stock solutions will keep indefinitely unmixed. For spraying, the two solutions are mixed in equal parts just prior to application. Smaller quantities of these may be prepared but the above proportions must be followed.

Apply the first spray just as the leaves are unfolding from the buds, and the second and third at about ten day intervals. In the case of sycamore anthracnose, the pruning of the infected twigs may be necessary.

Because of their superficial habit of growth, powdery mildews can be controlled after they have made their appearance on the leaves by the application of either finely divided sulphur dusts or weak lime-sulphur sprays (1-40). Since sooty molds are associated with attacks of sucking insects, the control of aphids, scale and other insects of this type will automatically eliminate the sooty mold fungi. After the insects are destroyed, a clear water spraying of the affected leaves is recommended.

Beside the parasitic leaf diseases among which the more common ones have been mentioned, are the injuries to leaves brought about by unfavorable growth conditions, the non-parasitic troubles.

Drought injury is the most common type of non-parasitic disease encountered and is evidenced usually by leaf scorch. Leaf scorch is characterized by the dying and turning brown of the leaf tissues around the edges of the leaves and between the veins. Hard maples and horse-chestnut are most severely affected because of their thin leaves and the great number of leaves produced per tree. The basic cause of leaf scorch is the inability of the tree to obtain water from the soil and furnish it rapidly enough to replace that lost from the leaf surfaces by evaporation on hot, dry, or windy days in summer. This trouble is most commonly seen on our broadleaved or hardwood trees growing in places where the soil is devoid of sufficient moisture.

Several applications of large amounts of water during the hot dry summer months is the obvious remedial measure. Where a sufficient water supply is available, the application of water slowly and over a period of perhaps twenty-four to thirty-six hours so that it all soaks into the soil, will replenish the soil moisture content to a satisfactory extent. Such heavy applications of water should be made not oftener than at two to three week intervals.

A form of drought injury appearing in conifers which is due to the same causes as that just described, is common in the spring of the year. It is usually called



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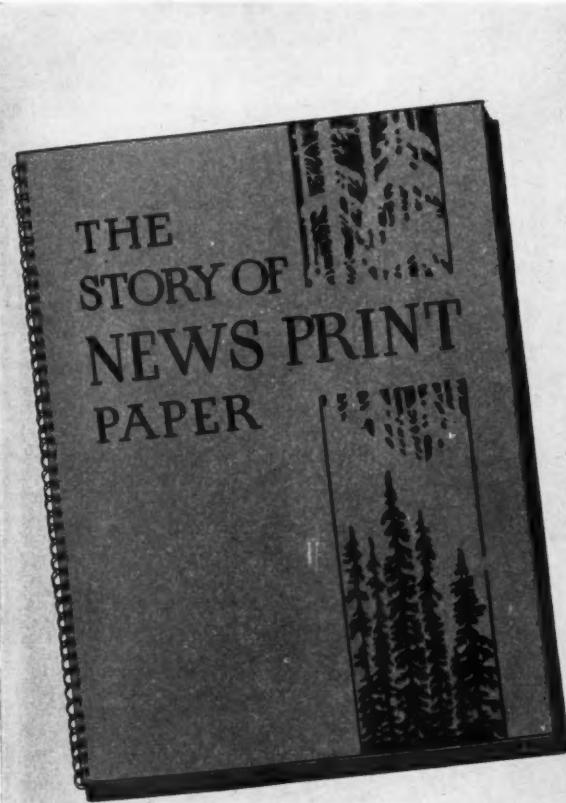
late winter drying and occurs on conifers located in exposed sites where the ground has little snow cover, where the trees are subject to much wind, or in sunny corners where the tops may get quite warm on bright days during February and March. It must be remembered that conifers transpire or evaporate water from their leaves during the winter. If the soil is dry or frozen on days of high wind or on occasional warm sunshiny days, especially in the late winter, this injury is likely. An interesting and important feature of this trouble is that the affected trees will not show the injury for some four to six weeks after it has occurred, because of the rigid structure of the conifer leaf. Heavy watering of the soil in the autumn before it becomes frozen is important in avoiding the occurrence of this trouble.

Another common non-parasitic leaf trouble is known as chlorosis. It is characterized by a yellowing of the leaf. This yellowing is varied and may be found between the veins, around the edges, over the entire surface or there may be a mottled yellow and green condition. Chlorosis results from a variety of causes. The non-parasitic causes are usually some soil nutrient deficiency, or excesses and deficiencies of the soil water supply.

Iron chlorosis, lime induced chlorosis or iron deficiency chlorosis is one of the best known of the non-parasitic nutrient de-

ficiency diseases. It affects many kinds of shade trees but is most common in the pin oak which is especially intolerant of alkaline soils. The cause of iron chlorosis is a deficiency of iron salts in the soil. This type of chlorosis may be alleviated by spraying the leaves of the affected tree with a weak solution of an iron salt such as iron sulphate, or two to four pounds of iron sulphate per hundred gallons of water. It has been found advisable to use some additional compound in the spray which will give better distribution of the iron salt over the leaf surface and insure its adherence. The leaves turn green in a few days after application of the iron solution. Such a treatment may have to be repeated a second time during the current growing season and has to be repeated during the following years just as is done in the Hawaiian Islands in the culture of the pineapple. Or, ammonium sulphate and sulphur may be added to the soil in which the affected tree is growing. This changes soil reaction to an acid condition and renders iron compounds soluble.

Much study is now in progress and results have already been put into practical use in the control of chloroses of field crops due to other mineral deficiencies. It is to be hoped that these findings can be applied to remedial measures for shade tree leaf chloroses which do not at present yield to recommended treatments.



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Dwarf Tree Frogs

(Continued from page 268)

feet and sturdy, long legs. The cricket frog is also more active than the "spring peeper," being able to perform extended leaps with astonishing speed to capture an insect or to avoid those creatures that might do him harm. Among its leading haunts are the shores of muddy-bottomed pools, ponds and streams, where it is inclined to imbed itself in the mud of such waters.

Like the "spring peeper," its coat is effected by several tones, such as greens, light reddish brown and clay color. Mostly it is brown above, displaying between the eyes a triangular dusky spot. The mid-back carries a paler dash of color. The spots and dorsal patch may be green or red-brown, frequently edged with white. The eyes are glowing orange, pure gems of living fire.

The swamp tree-frog or swamp *hyla* is yet another of the miniature company, reaching an inch in length at maturity, an amphibian distributed over much of North America with the exception of northern New England. It is a gray or brown frog, possessing, or lacking with some individuals, lengthwise striping, or else markings in a group presented in lengthwise patterns. Its feet are without large webs, and neither fingers nor toes are supplied with disks. Hence it is not an expert climber or swimmer.

The swamp *hyla* is hardly known to exist by many outdoor students. The same is true of other tree-frogs, hiding, secretive, mystic dwarfs—gnome-like individuals whose voices may greet us as though from an unseen spirit, calling but undiscernible.

Oregon Oak—Tree of Conflict

(Continued from page 266)

seedlings. All seedlings and many larger trees are frequently killed out by fires which do little permanent harm to the grass. As a matter of fact, fires are often set for the specific purpose of killing off the oak. All in all, the tree encounters stiff opposition when it contests a habitat occupied by grass, but still it encroaches, persistently. There are no evidences of grass taking over oak stands, except where the tree has been decimated by man; but almost every oak stand is actively pushing out into adjoining grassland.

Two fungus diseases bear down upon the oak, one a root or basal rot, commonly called shoestring rot, and the other a leaf mold. Neither one is sufficiently prevalent to constitute a serious menace, but some losses are attributable to the rot.

A more serious parasite is the mistletoe. Christmas may be a season of peace and good will to men, but not to oaks, for mistletoe grows by robbing oak of its food. Because of its romantic appeal the mistletoe is tolerated in oak groves whereas other pests are usually speedily eliminated. Mistletoe seeds are propelled for several feet with explosive force and once a plant becomes established on a tree, it quickly spreads its family around. Eventually the oak may be almost obscured,

and sometimes is killed, by the rank growth of this parasite. Mistletoe may be a contributor to romance, but it is a definite contributor to decline of the oak.

A number of insects harass the oak, but only two of them are sufficiently serious to merit consideration. One of these is the twig girdler, a particularly insidious pest. It operates by girdling small branches, working completely around the twig beneath the bark. Branches may seem sound enough but a heavy wind will break them off. The open wounds so produced are dangerous because they permit entry of fungus spores. The twig girdler thus really gives the tree the old one-two.

The other pest is a defoliator, the oak looper. It works something like a seven-year itch—is endemic most of the time but about every seven years it assumes epidemic proportions. Every oak for miles around may be completely stripped of foliage after a serious invasion of the loopers. The effect upon the tree is a great reduction in growth for one or two seasons subsequent to the attack.

In passing, mention should be made of a rather spectacular but relatively harmless insect pest on oak. This is a small wasp which irritates the leaves to such an extent that they produce papery galls an inch or more in diameter. Larvae of the wasp are harbored inside the gall. In the autumn the galls on fallen leaves will pop beneath your feet as you walk in an infected oak stand. The insect bears the same relation to the oak as a few fleas on a dog—doesn't do much damage, keeps the mind off other troubles.

Pine trees often drown their insect predators with pitch, but there isn't much the oak can do about its assailants; it just confounds them by refusing to die.

All these diverse and numerous enemies yapping at its heels are scorned by the oak but there is one relentless competitor

(Continuing on page 288)

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JUNE, 1940

Washington, D. C.

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Oregon Oak

(Continued from page 286)

with whom it wars unceasingly, and generally unsuccessfully — Douglas fir. The ironic fact is that the fir alone is unable materially to extend its range into unforested areas; it waits until the oak improves the site, then poaches the ground so gained. Douglas fir seeds contain perhaps one-twentieth as much food as oak seeds and early growth of fir is proportionately limited. Survival of first year oaks has not been investigated but first year Douglas fir seedlings show a mortality ranging from eighty to one hundred per cent. However, once it obtains a footing, the fir grows much more rapidly than oak. Decay of oak leaves increases the fertility of the site; the additional humus improves soil structure and aids in water retention; the penetration of oak roots increases percolation of water; all these things aid the growth of plants on the site. Since fir grows faster than oak, the more rapidly the oak improves the site, the more certain it is to be overwhelmed.

Oak often appears as a border around Douglas fir stands, or as a thin belt between fir and grassland. Examination of open areas adjacent to fir forests will generally reveal a lack of reproduction but any oak clumps nearby will almost invariably contain some fir. This is the beginning of the end. The fir thrives beneath the oak, which is then subjected to a fatal perversion of its hospitality. Inherent characteristics of the two trees are of course determinants in the race. Oak is normally a short tree; fir is normally a tall tree and its single leader will poke out through small holes in the canopy as it stretches upward. From this point on, it is simply a matter of time—the end result is always the same. Oak does not endure under the shade which is quickly produced as more and more fir climb out above their one-time host. The weaker members of the original oak colony begin to die out, though they may persist for years near the edges of the stand.

Particularly well established oaks will continue to struggle on for a long time. In unusual cases big trees may be found still living beneath a fir stand twice as tall. The writer has found oak still alive after having been overtapped for more than twenty years. These trees undergo a radical change in form. There is no round crown as in open grown trees but instead they become tall and spindly as they make a desperate effort to reach up for light. In the final phase old veteran oaks, completely surrounded by a fir forest, are beaten at last, but they hang on, trunk blackened, still upright.

It is a biologic tragedy that a tree which successfully beats off the attacks of fires, men, insects, and fungi, should finally succumb only through its own tremendous struggle to make inhospitable sites favorable for tree growth. The spirit of the oak is best evidenced by the old veterans grimly hanging on, however hopelessly, long after a wave of Douglas fir has swept over them. The oak never stops trying.

WHO'S WHO

Among the Authors in This Issue



Stanley W. Abbott

STANLEY W. ABBOTT (*The Blue Ridge Parkway*) speaks with authority of this lovely recreation road, for he is an experienced Park man and has been with the National Park Service since the inception of this particular project.

ELSIE A. PARRY (*The Tree That Changed A Country's Name*) is a New Yorker by birth, she says, but not by inclination. A graduate from Hunter College, she is very versatile—can handle a trout rod, a lettering pen and the steering wheel of a boat—but she likes boats best.

STEWART H. HOLBROOK (*Forty Men and a Fire*) describes here the splendid work in forest fire control being done by the unique "40-man" crew of the U. S. Forest Service.

EDNA N. SATER (*More Fish for the Backwoods Angler*) is a native of Washington State — now living in Washington, D. C. She specialized in journalism, feature and radio writing. Associated with several newspapers in the West, since coming back to Washington she has been with the Bureau of Fisheries.

W. F. McCULLOCH (*Oregon Oak*) refuses to take himself seriously, though he is a professor of forestry at Oregon State College. He speaks of "infesting" the West Coast woods from 1913 to 1928, "from Alaska down as far as trees go." During this time he followed a devious trail, from pearl diver to inspector of locomotive ashpans and chief of the forest survey. Then migrated East and for nine years specialized in forestry. Finally the West Coast drew him back, and he says now he keeps busy "injecting a little sili-culture into the boys at Oregon State."

A. G. DRAPER (*The Lone Ranger Rides*) was born in Brooklyn and graduated from Exeter, in New Hampshire, and Harvard College. Later employed by the New York Times, he is now a ranger in the New York State Forest Service.

HARRY EDWARD MILLER (*Dwarf Tree Frogs*) calls himself a farmer but has been a life long student of the out-of-doors. He was first to call attention to the pure white type gray squirrel, found in the neighborhood of Saratoga Springs.

THE COVER — "Minnesota Sunset" — photographed by B. L. Brown.



Edna N. Sater

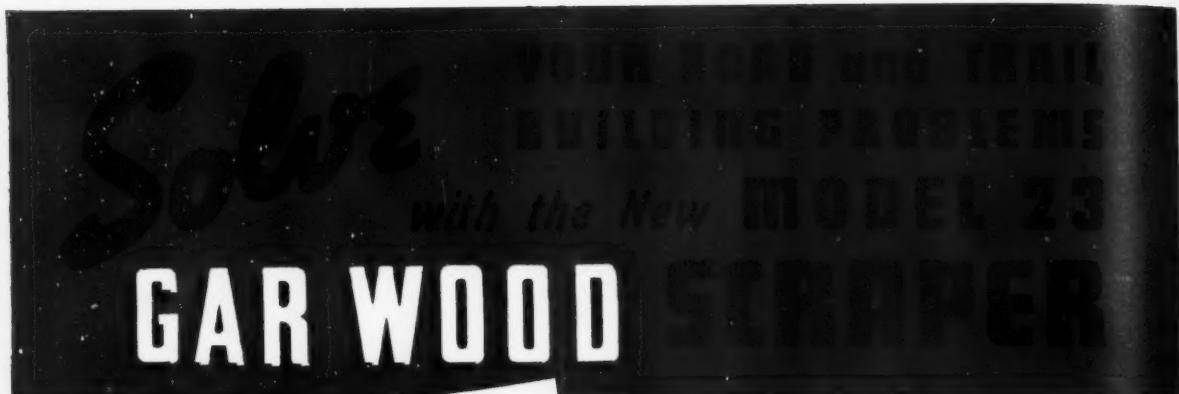
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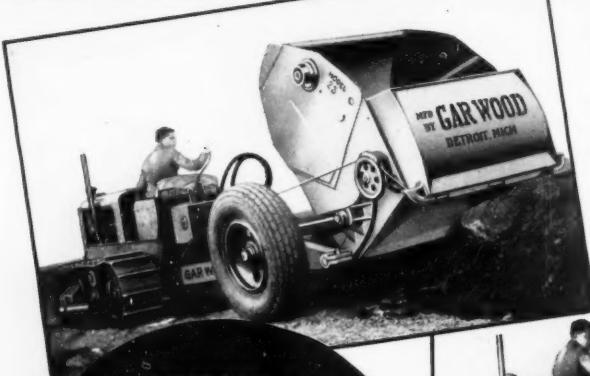
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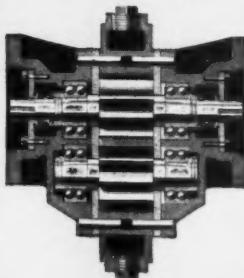


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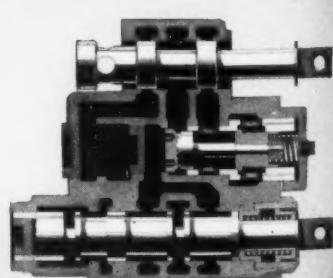
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